141

Conseil Permanent International pour l'Exploration de la Mer

CHARLOTTENLUND SLOT – DANEMARK

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RAPPORTS
ET
PROCÈS-VERBAUX DES RÉUNIONS

Volume 141

1ÈRE PARTIE

PROCÈS-VERBAUX

Novembre-Octobre

1955

2ÈME PARTIE

RAPPORT ADMINISTRATIF

1954

En Commission chez

ANDR. FRED. HØST & FILS

COPENHAGUE

Prix: Kr. 18.00

Juin 1956

Conseil Permanent International pour l'Exploration de la Mer

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QUARANTE-TROISIÈME RÉUNION

COPENHAGUE, OCTOBRE-NOVEMBRE 1955

BUREAU DU CONSEIL:

Jusqu'au 25 Octobre	*A partir du 25 Octobre*

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M. le Dr. K. A. ANDERSSON.	M. le Dr. K. A. ANDERSSON, M. A. T. A. DOBSON.

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M. le Dr. E. LELOUP,	M. le Dr. J. FURNESTIN,
M. le Dr. Å. VEDEL TÅNING.	M. le Dr. E. LELOUP.

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M. le Dr. JULIUS CLAUSSEN;
Ministerialdirektor, Bundesernährungsministerium; Vorsitzender der deutschen wissenschaftlichen Kommission für Meeresforschung;
Bonn.
*M. le Dr. GERHARD MESECK;
Ministerialrat, Leiter der Unterabteilung Fischwirtschaft im Bundesministerium für Ernährung, Landwirtschaft und Forsten;
Bonn.

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Directeur de l'Institut de Recherches Maritimes;
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Danemark:

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M. B. DINESEN;
Chef de Département, Ministère des Pêches;
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Grønlands Fiskeriundersøgelser;
Charlottenlund Sloi, Charlottenlund. (Suppléant)

Espagne:

*M. l'Amiral RAFAEL GARCÍA-RODRIGUEZ;
Directeur de l'Institut Espagnol d'Océanographie;
Alcalà 27, Madrid. Remplacé par.
M. le Professor R. MONTEQUI; Instituto Español de Oceanografía, *Alcalá 27, Madrid.*
M. le Dr. JUAN CUESTA URCELAY;
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Finlande:

M. le Professeur E. HALME;
Directeur de l'Institut Scientifique des Pêches;
Helsingfors.
M. le Professor, Dr. I. HELA; Directeur de l'Institut pour l'Exploration de la Mer; *Helsingfors.*

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* Empêché d'assister à la réunion.

France:
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M. A. J. AGLEN;
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[1]) Mr. R. G. R. WALL ceased as from 1. November 1955 to be a British delegate and was succeeded as such from that date, by Mr. R. S. WIMPENNY (Deputy Director, Lowestoft). Mr. A. J AGLEN will act as senior delegate.

Pays-Bas:
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Directeur des Pêches;
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* Empêché d'assister à la réunion.

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* Empêché d'assister à la réunion.

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International Commission for the Northwest Atlantic Fisheries, Canada:—

M. le Dr. Å. Vedel Tåning; Director, The Danish Institute for Fisheries and Marine Research, *Charlottenlund Slot, Denmark.*

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Et ve Balik Kurumu Umum Müdürlügü, *Ankara*:—

M. I. Artüz; p. t. *Charlottenlund Slot.*

General Fisheries Council for the Mediterranean:—

M. M. J. Girard; Secretary to the G. F. C. M., *Viale delle Terme di Caracalla, Roma.*

Commission Internationale pour l'Exploration de la Mer Méditerranée:—

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Dr. phil. A. F. Bruun,
Cand. mag. Torben Wolff,
Cand. mag. J. B. Kirkegaard,
Dr. phil. P. L. Kramp.

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Amanuensis, Cand. mag. Børge Jakobsen,
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Cand. mag. Kr. Marius Jensen,
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AGENDA

for the forty-third Meeting of the International Council for the Exploration of the Sea.
Copenhagen, 24th October—1st November, 1955.

A. General Assembly: Opening Meeting.

1. Welcome and Opening Address by the President.
2. Report as to renewed Participation.
3. Presentation of Administrative Report.
4. Report on Permanent Commission.
5. Report on International Whaling Commission.
6. Report on International Commission for the Northwest Atlantic Fisheries.
7. Report from FAO on World Resources Survey and Bibliographic Programme.
8. Report on the United Nations' Rome Conference.

B. Meeting of Delegates.

9. Opening of the Proceedings by the President.
10. Presentation of Estimated Statement of Accounts for 1954-55.
11. Final Approval of the Accounts for 1953-54.
12. Adoption of the Administrative Report.
13. Appointment of an *ad hoc* Committee to propose Candidates for the Election of President, First Vice-President and three Vice-Presidents.
14. Election of President, First Vice-President and three Vice-Presidents.
15. Consideration of the Consultative Committee's Recommendations approved by the Bureau.
16. Estimate for the Financial Year 1955-1956.
17. Nomination of Finance Committee Members and Editors.
18. Other Business.

C. General Assembly: Final Meeting.

19. Opening of the Proceedings by the President (including Budget Summary).
20. Presentation of Recommendations adopted by the Council.
21. Time and Place for next Council Meeting.
22. Other Business.
23. Conclusion of the Meeting.

1ÈRE PARTIE

PROCÈS-VERBAUX

REPORT

of

THE FORTY-THIRD MEETING OF THE COUNCIL

General Assembly, Opening Meeting, Monday, 24. October 1955, at 10.00 a.m.

Agenda, Point 1. The President opened the meeting and said:—

"Mesdames et Messieurs,

C'est avec le plus grand plaisir que j'ai par la présente l'honneur d'ouvrir la quarante-troisième réunion du Conseil International pour l'Exploration de la Mer.

Beaucoup de délégués, conseillers et d'autres amis sont venus de près et de loin afin de pouvoir assister à cette réunion.

A tous je souhaite la bienvenue amicale dans l'espoir que vos débats seront couronnés de succès."

The President then proceeded with the Agenda and suggested that a telegram should be sent to His Majesty the King of Denmark, and suggested the following text:—

"A Sa Majesté le Roi de Danemark.

Les membres du Conseil International pour l'Exploration de la Mer réunis à Copenhague à l'occasion de sa quarante-troisième conférence statutaire demandent la permission de témoigner à Votre Majesté leurs sentiments les plus respectueux.

ALBAN DOBSON,
Président."

The President continued:—

"I now have the rather sad task to tell you the names of whom of our members who have died during the past year:—

Colonel PIERRE TISSIER, who was Vice-President from 1945–47, and who was French delegate from 1945 to 1949. You do not have to be reminded of his work here during these years, and the honoured name that he bore. He was Director General of the French State Railways and died in the service of his country.

The other member was Professor H. H. GRAN, Norway, a highly respected member among the founder members. I need not remind you of the great work he has done for the exploration of the sea. He died quite recently and his name will go down in the world of science, particularly in connexion with plankton.

Let us stand for a moment."

The Assembly stood in silence as a tribute.

"Now, before we proceed with the Agenda, I wish to refer to one or two points of interest:—

Professor GRANQVIST of Finland, whom you all know, has retired from being a delegate for 20 years, and we welcome in his place Professor ERKKI HALME and also Professor I. HELA, who is to act as second delegate for Finland.

As representative of Spain has come instead of Admiral GARCIA RODRIQUEZ Professor R. MONTEQUI. I am sure you all wish these new delegates welcome.

I am also sure you wish me to welcome on your behalf our old friend, Dr. K. A. ANDERSSON, Council's Honorary President.

I also welcome on your behalf as observers the representatives from U.S.S.R., whom you remember as observers at the Paris Meeting, they are five, at the head is Professor DMITRIEV, and we are glad to see them here.

Then there is a delegation from Poland, they are four, lead by Professor CIEGLEWICZ and we give them a warm welcome to this meeting."

The President also welcomed other delegates and representatives from other international bodies.

Agenda, Point 2. All member countries have now agreed to a new five years period as from 21st July, 1955.

Agenda, Point 3. The President drew attention to the Administrative Report which he would ask the delegates to approve later.

Agenda, Point 4. The President then called upon the Chairman of the Permanent Commission, Mr. WALL, who spoke as follows:—

"I am most grateful to you, Mr. President, for giving me this opportunity to speak of the continuing work of the Permanent Commission, operating under the Convention of 1946 which you—though in another capacity—had such a large hand in forming and bringing into being as the executive and regulatory complement of this scientific Council, which has such a long and notable history.

Since this Council met a year ago in Paris, where I had the honour of giving you a similar report, the Permanent Commission has met once more. This was its Fourth Meeting, and it took place in London five weeks ago.

We had delegations attending the meeting from thirteen countries, the newcomers to full membership being the Federal Republic of Germany, which had acceded to the Convention since our previous meeting and whose delegation we have been very glad to welcome to our number. The Commission now comprises all the Scandinavian countries and Poland as well, and all the seaboard countries of Western Europe from the Federal German Republic as far south as Spain and Portugal and also including the United Kingdom and Ireland and Iceland. This means almost, though not quite, all the countries that fish the waters of the North East Atlantic and its dependent seas which the Convention of 1946 covers.

At its Fourth Meeting the Permanent Commission devoted itself to three main problems which I will just briefly mention in turn. The first was the problem of the mesh-sizes. Upon the initiative of certain delegations the Commission agreed to maintain the 75 mm. minimum mesh for the nearer waters unchanged for a further year, that is, until April 1957, whereas the minimum was to have been raised to 80 mm. as from April 1956; and meanwhile the Commission is to conduct through a specially appointed committee, which Mr. ROLLEFSEN of Norway will be chairing, a review of all the available data on minimum mesh-sizes and minimum size-limits of fish. This committee will advise the Permanent Commission at its next meeting in May 1956, whether any changes in the present arrangements are required.

This committee will have many I.C.E.S. faces, though we have not, Mr. President, actually remitted this study to your Council because we are reviewing existing knowledge rather than seeking new knowledge and because we do not wish to overburden this Council with avoidable requests for its assistance.

Another mesh problem we have, however, advanced with your help, and now we seek your further aid. The assessment you have made of the light trawl evidence for us has decided the Commission to allow trawl nets made of single twine and containing no manila or sisal to have a minimum mesh 5 mm. less than that which applies to other trawl nets. We are not entirely happy, however, about this definition of a light trawl, and we wish your Council to advise us on a more exact differentiation between the light trawl and other trawls that may be appropriate for the Commission's purpose of maintaining fishing equality between the one and the other in respect of mesh regulations.

The second problem before the Commission has been that of the industrial fisheries. This is a most important matter on which member countries hold conflicting or at least divergent views, and we are relying, Mr. President, upon the studies of this Council to help us resolve our problem in this field. Meanwhile the Commission has decided to continue the existing provision for industrial fisheries for a further two years, that is, until May 1958. We shall be extremely glad of all the new data you can give us by then. Indeed, we want you to give us not only the data, but the answer by then!

Lastly, the Commission gave much attention to the problem of enforcing the mesh and the size-limit regulations. The aim here is uniformity of enforcement action, or as near to that as is feasible in the differing circumstances of the fisheries of the several member countries. The most interesting decision of the Commission was to resolve upon the appointment of an officer of its own, who will visit such member countries as may desire his services in order to advise upon the enforcement of the Convention. That is not international inspection, but the Permanent Commission is being given a certain collective function in the enforcement field.

It would be right to say, Mr. President, that this has been for the Permanent Commission a year of review and consolidation rather than of fresh advance. A period of stock-taking is, however, no bad or discouraging thing; and we are still looking ahead and preparing for such further advances in the conservation field as we may find necessary by continuing fruitfully consultations and discussions on which the Permanent Commission countries embarked a year ago, and which are aimed at replacing the Convention of 1946 by a more flexible instrument which would also be of wider scope."

Agenda, Point 5. The President then called upon Mr. LIENESCH to speak as Vice-Chairman of the International Whaling Commission.

"The I.C.E.S. having been invited to send an observer to the 7th annual meeting of the International Whaling Commission the President appointed me and I duly attended this meeting, which was held in Moscow.

At the outset I gained the impression that the meeting was not fully convinced that the standing regulations adequately protected the whale stocks. Sufficient data to reach a definite conclusion are not available, however, and it is clear that further investigations are badly needed.

After some discussion decisions were taken on three closely connected points, but were not all unanimous.

This means that the realisation of these decisions in the Schedule of the Convention does not come into

operation until they have been submitted to all contracting governments, who have the right to object within a period of 90 days. If any objection is raised during that period, a further 90 days must elapse before the amendment can come into operation and even then it is not binding on those contracting governments who have objected.

The decisions in question are as follows:—

1) The Commission decided that the 15,500 B.W.U. limit now in operation shall be reduced by 500 units for the season 1955–1956, and thereafter by a further 500 to 14,500 units.

2) To protect the blue whale stock in the Antarctic the Commission decided that no blue whales should be taken before the 1st February, instead of 21st January, the present date.

3) For a period of 3 years, certain hitherto closed areas in the Pacific sector shall be open for pelagic whaling. The area concerned is roughly that south of latitude 40° S., between longitude 70° W. and longitude 160° W. This enables the whale stocks in the area to be studied.

As is usual, several problems were studied by a joint committee of scientists and technicians.

The U.S.A. is to propose means whereby better methods of inspection can be introduced.

The Norwegian government proposed that the observer appointed to a factory ship should be of a different nationality from that of the ship. The matter was widely considered by the Commission.

The records show that infractions of the regulations were fewer last season, but the number of whales lost was regrettably higher than in previous years owing to the bad weather conditions.

In its budget for the current year the Commission set aside £ 1000.– for the intensification of whale marking efforts. Whale marking affords invaluable data on length of life and the migratory routes followed by whales.

The regulation prohibiting the taking of blue whales in the North Atlantic for a period of 5 years was rescinded.

The Commission decided that a scientific sub-committee should meet again to consider scientific problems, in anticipation of the 1956 annual meeting, which is to be held in London in July.

The arrangements which had been made by the U.S.S.R. were outstanding and contributed much to the success of the conference. The Commission was offered an excursion to Leningrad as guests of the U.S.S.R. after the final plenary session. This was also very much appreciated and brought the meeting to an interesting finish."

Agenda, Point 6. The President called upon Dr. Tåning to report as regards the International Commission for the Northwest Atlantic Fisheries.

"The opening meeting was held in the House of Commons in Ottawa in the presence of the Prime Minister and the Minister of Fisheries of Canada. The remaining meetings were held in Chateau Laurie. The meeting was opened officially on 6. June, though discussion groups met on 3. and 4. June to consider various questions relating to Panels 3, 4, and 5. The final plenary session took place on 11. June. Eight of ten adherent countries were represented at the meetings. Observers were present from F.A O., I.C.E.S., Permanent Commission, International North Pacific Fisheries Commission, International Pacific Halibut Commission, the special committee for I.G.Y. and from the German Federal Republic.

In addition to the 4 plenary sessions, several meetings were held by the different committees, viz., the Standing Committee on Finance and Administration, the Standing Committee on Research and Statistics, and the 5 Panel Committees; meetings were also held by various working groups, and an evening was spent on discussion of redfish researches.

The I.C.N.A.F. Estimate of expenditure for 1955/56 is $ 34,100.–. It was decided that the annual meeting for 1956 should be held at the Commission's headquarter in Halifax 11. June during the week following. A proposal was adopted that § 5 of Article II of the Convention should be amended so as to permit the Commission at its discretion to hold its annual meeting outside North America, and an invitation was extended by Portugal to hold the 1957 meeting in Lisbon.

Dr. Stewart Bates, Canada, retired from the Chair, and Captain Tavares de Almeida, Portugal, was elected Chairman for the coming 3-year period.

The following matters dealt with at the meetings were of special interest. The international regulation for a mesh of $4^1/_2$ inches (114 mm.) in the haddock fisheries has been in effect since 1. June 1953 in Sub-area 5 (Georges Bank and the Gulf of Maine); the long-term benefit of this larger mesh has proved to be greater than was originally estimated. It was accordingly recommended that the larger mesh should be used in Sub-area 4 (which includes the Nova Scotia area) and should apply to cod also. The possibility should be studied that larger mesh might benefit Sub-area 3 (New Foundland area), for which a mesh of only 4 inches (102 mm.) is at present recommended.

New regulations for the sub-areas were prepared affecting various details of the net, mesh, measurements, etc. Under them vessels using small-mesh nets for other species will not be permitted to land more than 5000 lb. or 10% by weight of haddock or cod.

The current studies of conversion factors are to be continued, but should be completed not later than June 1956, and the returns should be extended to cover statistics of landings of all species in each sub-area.

The *redfish symposium* convened by Dr. H. Graham showed that investigations made in recent years have very much increased our knowledge of this important fish. It was proposed that a similar *symposium on cod* should be held in 1956, with Mr. Rollefsen as convener. It was also decided that the scientific advisers to the Committee on Research and Statistics should meet in Biarritz, in March 1956, to consider

several important questions connected with researches of mutual interest to the countries on both sides of the North Atlantic (e. g., sampling, population dynamics, mesh regulations, interrelations of fish stocks, cod biology, halibut researches). The Chairman of I.C.N.A.F. asked me to convey an invitation to I C.E.S. to send an observer to this meeting.

Owing to the increased interest in the halibut fishery in Greenland waters, age determination, tagging, and drift of pelagic stages were considered and it was recommended that work on these problems should continue in 1955/56, and that reports on the researches should be sent to Dr. Paul Hansen. It was also recommended that I.C.N.A.F. should consult with I.C.E.S. regarding publication of hydrographic data of most immediate value to Sub-area 1 (Greenland waters).

The observer from F.A.O. (Dr. G. L. Kesteven) read a paper in which he stressed the desirability of obtaining a survey of living aquatic resources in the I.C.N.A.F. area. The paper was discussed by a working party, which recommended that statistics of all commercial species should be published, population analyses undertaken to determine optimum fishing rates, and studies made of marine ecological systems, everything possible should be done to help F.A.O. to realize the plan."

Agenda, Point 7. Dr. Kesteven, F.A.O., was now called upon by the President to report, and spoke as follows:—

"Mr. President,

The Food and Agriculture Organization greatly appreciates the opportunity to participate in the meetings of this Council. May I first say that Dr. Finn regrets that he is unable, because of meetings, at this time, of our governing bodies, to be present at this meeting; he sends formal greetings to the Council and personal greetings to his many friends here present.

In respect of our work on the survey of resources, on which I have to report, I must say that we still remain in developmental stage. We are still concerned with problems of definition, for example, of the very term 'resource'. We believe that many different things are referred to under this term and whilst we seek to establish a firm definition we at least have come to the conclusion that the definition must be broad in scope and that it must have reference to the eco-system. We know that this involves us in many difficulties; that it will not be easy to identify and demarcate such systems. If we are uncertain about the term 'resource', how much more uncertain we must be in undertaking the compilation of information about resources. We have made a preliminary essay in this work in a paper that I understand I shall have the opportunity of submitting to one of your committees during this week. We shall be grateful if we may have the critical comment of this Council on the material we have assembled and advice on the further development we might attempt of this compilation. Thus far I have referred to the first of our problems—namely how to define and identify resources, and how to determine what information concerning them should be assembled. The other problem with which we are confronted in this developmental stage is one of methods: how to tap the sources of information, in printed literature, domestic reports and elsewhere, and how to gather together, organize, and store that information; and, subsequently, how to draw that information from storage, put it together, reduce it to special form, and present it in special ways. On this matter, Mr. President, we were fortunate last year in having the assistance of Dr. Friðriksson, and of other members of this Council, at a meeting we convened in Paris to consider the problems of terminology and documentation for fisheries biology. We hope that we may continue to have this assistance, and we contemplate a further meeting of this group of consultants during 1956 to carry this work forward. I hope that there may be opportunity during this meeting to secure advice from members of this Council on the agenda for that meeting."

Agenda, Point 8. The President called upon the Secretary General to report as to the meeting at Rome in connexion with resources of the sea.

"At the General Assembly of the United Nations on 14. December 1954, the General Secretary was asked to arrange for an International Technical Conference on the Conservation of the Living Resources of the Sea to be convened on 18. April 1955.

After a small preparatory meeting held in New York in January 1955, the Conference took place at the F.A.O. Headquarters in Rome from 18. April to 10. May 1955. Forty-five countries were represented by delegations and six other governments sent observers. Observers from practically all existing international organizations, 13 in all, were also present. The total number of people attending the meeting was about 180. The Conference elected a Chairman, Mr. Sunnanå of Norway, and 10 Vice-Chairmen. Twenty-four plenary meetings were held, as well as several meetings of committees and sub-committees. Seven documents described as General Background Papers were distributed before the Conference, but 20 more papers were presented during the meetings, some of which were comments submitted by delegations.

The main agenda of the Conference consisted of 5 items, which covered the following subjects:—

I. Objectives of Fisheries Conservation.

II. Types of scientific information required for a Fishery Conservation Programme.

III. Types of Conservation. Measures applicable in a Conservation Programme.

IV. Principal Specific International Fishery Conservation Problems of the world, for the Resolution of which International Measures and Procedures have been instituted.

Under this item a survey was given of all International Conservation Organizations in the world and the principles on which the measures employed are based in each case.

V. The applicability of the existing types of International Conservation Measures and Procedures to other International Fishery Conservation Problems.

This heading covered many important questions, for example the Problem of the Coastal State, the extent of its interest and responsibility, problems relating to the operation of conventions, biological or geographical coverage of conventions, problems involved in reaching agreement on conservation measures and procedure, problems created by new entrants into a fishery under Conservation management and problems of effective enforcement. Finally, endeavours were made to find out what areas and species were not at present covered by Conservation Conventions.

The most important conclusions reached by the Conference may be summarized as follows:— The principles upon which existing conventions are based were found to be practical and sound, and it was felt that a convention should cover either a given stock (or stocks) of marine animals, or a definite area. Conservation regulations introduced under a Convention should be based on scientific findings and all signatory states should participate, as far as possible, in the investigations required, or should support a joint research staff set up for the purpose. Conventions should be clear as regards rights and duties of member Governments; they should specify the kinds of measures to be used and should include provisions for effective enforcement. The Conference considered that conventions and regulatory measures should be adopted with the agreement of all interested countries, but drew attention to problems that might arise from disagreement among states on scientific and technical matters relating to fisheries conservation. Disputes might arise over such matters as:— (1) The need for conservation measures, or the nature of such measures, and (2) the need to prevent regulatory measures already adopted by one or more states from becoming nugatory by the refusal of other states to recognize them.

As indicated in § 7a of the General Conclusions of the Conference, a solution to such problems might be found through

a) Agreement among states to submit such disputes to the arbitration of suitably qualified and impartial experts specially chosen by the parties concerned, and

b) Agreement by all states fishing a given stock of fish to accept the responsibility for co-operation with each other in adequate programmes of conservation, research, and regulation.

The Conference recognized that a problem is created when intensive exploitation of offshore waters which adjoin heavily fished inshore waters, by new fishing operations initiated by another state considerably affects the abundance of fish in the inshore waters. In that case the entire area should be included in a conservation system involving all the states concerned and should be subject to conservation regulations adequate to maintain the maximum sustainable yield."

The meeting terminated at 10.45 a. m.

Meeting of Delegates, First Session, followed immediately.

Agenda, Points 9 and 10. The President opened the proceedings and presented the estimated statement of Accounts for 1954/55.

Agenda, Point 11. The President moved the formal approval of the audited Accounts for 1953/54 and this was carried.

Agenda, Point 12. Approval of the Administrative Report. The President asked the delegates to approve this report, which was then adopted by the Council.

Before proceeding with the election of the *ad hoc* Committee the President called attention to the question of the application of the U.S.S.R. and Poland to be admitted to membership of this Council. It was understood that all countries had now agreed to this admission, but as no reply had been received from Portugal, this matter was deferred until a later meeting of delegates.

Agenda, Point 13. The President said that the Bureau proposed that the Council should elect an *ad hoc* Committee, as in previous years, and consisting of three members, one to represent each of the three groups consisting of: 1) Denmark, Finland, Iceland, Norway and Sweden; 2) United Kingdom, Germany, Ireland, and The Netherlands; and 3) France, Belgium, Portugal and Spain.

The President also informed the meeting that he would be retiring from the Council and consequently would not be standing for election.

Dr. WENT said that in connexion with the elections he would like to make a suggestion, which might simplify the choice of persons for the various offices. The suggestion was that the Council comes to a definite understanding that no Vice-President should in future have any claim to the First Vice-Presidency and the First Vice-President has likewise no future claim to the Presidency.

The President asked if Dr. WENT desired a vote on this, but Dr. WENT stated "no," but would like the Council to come to a definite understanding of the matter.

The meeting adjourned at 12 a.m.

Meeting of Delegates, Second Session, Tuesday, 25. October 1955, at 11.30 a. m.

Agenda, Point 14. The President opened the proceedings by satisfying himself that all participating governments were present and by calling on the Chairman of the *ad hoc* Committee to report. Dr. RAMALHO said that the Committee unanimously proposed the election of Professor H. U. SVERDRUP as President, Dr. Å. VEDEL TÅNING as First Vice-President, Dr. JEAN FURNESTIN, Dr. E. LELOUP and Mr. J. A. AGLEN as Vice-Presidents. The proposal was then moved by Dr. RAMALHO and seconded by Mr. JÓN JÓNSSON and was carried unanimously.

Mr. DOBSON said that he would now retire and ask Professor SVERDRUP to take over, but on this occasion he first wished to express his appreciation of having had the honour to act as Council's President for 3 years and assured the delegates how happy he had been to do so. He hoped to be allowed to say a few words of farewell at the Final Meeting.

Professor SVERDRUP said that on this occasion he would only assure the delegates that he would serve to the best of his ability and that he hoped on a later occasion to be able to express the thanks of the Council to the retiring President, Mr. DOBSON, for the manner in which he for many years had managed the affairs of the Council, years which had been fraught with difficulties and where he always looked to the interest of the Council.

The meeting terminated at noon.

Meeting of Delegates, Third Session, Tuesday, 1. November 1955, at 10.00 a. m.

The President, having opened the meeting, referred to the fact that the Soviet Union and Poland had signified their desire to become members of the Council. He was pleased to inform the meeting that the membership of these countries had been approved by all member states and that, therefore, the U.S.S.R. and Poland became members of the Council on that day, because Council's working year began on the first of November. The new member states were accordingly represented by delegates, and it was his privilege and pleasure to extend a cordial welcome to Professor N. A. DMITRIEV and Professor A. N. SVETOVIDOV as delegates of the U.S.S.R. and to Professor CIEGLEWICZ as a delegate of Poland.

The participation of the U.S.S.R. and Poland in the Council's work—the scientific exploration of the sea for the purpose of ensuring the best possible utilization of marine resources—would be invaluable.

It was a notable characteristic of the Council that the delegates and experts attending its meetings were drawn not only from specific fisheries research establishments but also from universities and independent research organizations. The importance of this union between what he would call the fundamental and the applied marine sciences could not be overestimated. It had resulted in mutual stimulation; furthermore, the fisheries research establishments drew their recruits from the universities.

He mentioned the matter on this occasion, because they all had the greatest admiration for the fundamental and applied work in the marine sciences that was carried on in the new member states—and, he dared say, particularly in the U.S.S.R. He was confident, therefore, that their co-operation in the work of the Council would be of the greatest benefit to the older members and he hoped that the benefit of the co-operation would be mutual.

Agenda, Point 15. The President drew attention to the list of recommendations from the Consultative Committee which had been distributed among the delegates, and announced that they had all been approved by the Bureau. He intended to deal under the Estimates with the recommendations involving expenditure.

The recommendations were then adopted *en bloc* (see list of Resolutions below).

Agenda, Point 16. The President presented the Budget and drew attention to the changes between the first and the final estimates. On the income side there would now be an increase of 60,000 kroner resulting from the membership of U.S.S.R. and Poland. Salaries had been increased by 7,500.– kr. Under the heading of Office Expenses the sum of kr. 10,000 had been allowed for renewal of furniture and kr. 9,000 and 1,500 to cover the Consultative Committee's recommendations for punched cards for hydrographical and statistical records, so that the total for that item amounted to kr. 53,500.–.

Travelling Expenses had been increased by kr. 1,000.–.

On Publications, a sum of kr. 16,000 would be saved by printing some of the publications outside Copenhagen, but to meet further expenses arising from increased membership the sum of kr. 10,000 had been allowed to cover "Unforeseen" expenditure.

The Estimates for 1955/56 were adopted.

Agenda, Point 17. The President informed the Council that in addition to the permanent members of the Finance Committee he had appointed Dr. LELOUP as his personal nominee from the Bureau and proposed the election of Dr. CUESTA, Mr. LIENESCH and Dr. HALME. — Approved.

The President proposed the re-election of Mr. LUMBY as Editor of the *Journal du Conseil* and the

election of Dr. FRASER as Editor and Dr. THORSON as Co-editor of the Plankton Sheets. — Approved.

Agenda, Point 18. The President said that the Bureau had for some time been examining the question of the status of the I.C.E.S. as compared with that of other international organizations. Several of these enjoyed special privileges, such as facilities for rapid handling of mail, exemption from customs duties, and exemption from income tax for their employées. These privileges would be of considerable help to the I.C.E.S.

However, it appeared that the I.C.E.S. could not at present be granted these privileges because the organization lacked the necessary legal status. It was possible that this stumbling block could be removed if the member states agreed to sign a **Convention**, thereby placing the co-operation between the adherent states on a statutory basis. The Bureau wished to ask the Council for authority to examine the question further. — Agreed.

Continuing, the President said that it was always with great regret that they bid farewell to anyone who had devoted much time and ability to furthering the work of the Council.

On this occasion, when Mr. DOBSON retired from active participation in the work of the Council, to this regret was added a feeling of deep gratitude for the service which Mr. DOBSON had rendered to the Council, particularly during the difficult period when work was resumed after the last war.

Mr. DOBSON came to the Council as a delegate in 1938 and was then elected Vice-President, he served as First Vice-President from 1946 to 1952, and was retiring after having been their President for three years.

He disclosed no secret when he said that for part of the time when Mr. DOBSON was Vice-President the finances of the Council were matters of great concern and that it was thanks to Mr. DOBSON's administrative ability and conscientious handling of affairs that the difficulties never hampered the activities of the Council.

Needless to say, Mr. DOBSON's interest in their administrative affairs was only an expression of his understanding of the Council's main task and his devotion thereto. No President was competent to form an opinion on all matters pertaining to the scientific work of the Council. If any such question were brought to the Bureau the President was always obliged to seek the advice of others, and this Mr. DOBSON had done with great prudence. The years of Mr. DOBSON's Presidency were, therefore, years of great activity, as was evident from the large attendance at the meetings and the numerous contributions presented.

In recognition of Mr. DOBSON's long and outstanding service the Bureau wished to propose to the delegates that Mr. DOBSON be elected Honorary President of the Council. — Agreed.

Mr. DOBSON said: "I do not know how to thank you all for the very great honour you have bestowed on me in appointing me an Honorary President, but I will confine myself on this occasion to express my gratitude to you for still keeping my name on the books of the Council and so enabling me to follow the activities of the Council. I can assure you that all the work I have done here has always been a labour of love."

The meeting terminated at 10.50 a.m.

General Assembly, Final Meeting, Tuesday, 1. November 1955, at 11.00 a. m.

The President opened the meeting, and proceeded to read a telegram received from H. M. the King of Denmark:—

"Mes remerciements sincères pour votre aimable télégramme. FREDERIK R."

The President then announced that at the meeting of delegates preceding this meeting he had had the pleasure of extending a cordial welcome to two new member states, U.S.S.R. and Poland. The application for membership by these countries had been approved by all member states, and since the Council's working year began on the first of November, and it so happened that this year the Final Meeting took place on that date, the new member states were duly represented by delegates.

He wished only to repeat his welcome and confidently expressed the hope that the participation of the U.S.S.R. and Poland in the Council's work would be to the advantage of all parties concerned.

The head of the U.S.S.R. delegation, Professor DMITRIEV, replied as follows:—

"On behalf of the Soviet delegation allow me to express to you our satisfaction that our country has been accepted as a member of the International Council for the Exploration of the Sea. We look forward to our co-operation with countries interested in fisheries in the North Atlantic and we hope that our contribution will help to advance the study of the interesting problems that face us. Successful fisheries depend largely on the careful investigation of the stocks of food fishes. We shall all of us strive to see that our fisheries flourish in the future. And now, Mr. President, I beg to thank you and the whole Council once more for the cordial reception given to us on this occasion."

The Polish delegate, Professor CIEGLEWICZ, also spoke, as follows:—

"I wish to express my thanks to all the delegates for accepting Poland as a member of the Council.

As a country with rather limited experience in fishery research we are glad of the opportunity to benefit from your wider experience of these matters. We also hope that we ourselves may contribute to the common stock of knowledge by solving the problems in front of us. I should also like to add that we are grateful to the Danish Government for the kind reception given to us here."

The President briefly described the Estimates accepted by the Council for 1955/56. The total expenditure was expected to be kr. 352,159.– which left an excess of income over expenditure of kr. 42,978.–.

Agenda, Point 20. The President summarized the resolutions adopted on the basis of the Consultative Committee's recommendations.

Agenda, Point 21. The President announced that the next Council Meeting would be held in Copenhagen from 1. October to 9. October 1956. The Special Scientific Meeting on "Herring Races" would begin on 27. September 1956.

Agenda, Point 22. The President said that he was happy to inform the meeting that at the meeting of delegates which preceded this meeting our retiring President, Mr. Dobson, had been elected Honorary President of the Council, in recognition of his long and outstanding service to the Council. He reminded the meeting of the fact that Mr. Dobson had been a delegate of the United Kingdom and a member of the Bureau since 1938, and had been First Vice-President from 1946 until 1952, when he was elected President. Thanks to his administrative ability, he had been of the greatest service in guiding the Council through the difficult years when work was resumed after the last war. The President then addressed Mr. Dobson as follows:—

"It is now my pleasure to inform you that not only have the delegates wished to honour you by electing you an Honorary President, but these and your many friends who take part in these meetings also wish to present you with some tangible evidence of their appreciation of your services. I therefore have pleasure in presenting you with this cheque asking you to purchase some article with it which you may especially desire."

On behalf of the Staff the General Secretary thanked Mr. Dobson for his co-operation and kind advice he had always given them during the time they had worked under him as President.

Mr. Dobson replied as follows:—

"I do not know quite where to begin. I am quite overwhelmed by the very kind words which you Mr. President and Dr. Fridriksson have said about me.

First I am most grateful and honoured by your appointing me an Honorary President. Secondly I thank you with all my heart for the generous gift you have given me and especially for the form in which you have given it to me. There are one or two things which I particularly want to possess.

Now may I say a few personal words. I have had the privilege of working for this Council for three years as President and in the Bureau for 17 years, and it has always been a great pleasure to me. I remember the many distinguished colleagues with whom I have collaborated during all these years, Dr. Hjort, Dr. Heinrici, Dr. Martin Knudsen, M. Tissier, Dr. Andersson and many others, and it has been a great privilege to serve the Council.

I would like also to express my personal satisfaction that Poland is now back again in the Council and that the U.S.S.R. has been admitted as member. It is to me unthinkable that we should remain deprived of the great scientific resources of these two countries.

Now, Mr. President, may I say how happy I am to hand over the reins to you and in doing so, I want to express my appreciation of the help which you have always so generously given me. I should like to remind the Council of the several problems for which you have found solutions, which will be of abiding value to the Council.

I also wish to thank all the members of the Bureau for the loyal way in which they have all worked, and for the support and advice they have given me both as Vice-President and as President. I thank also the Danish delegates and especially my old friend Mr. Dinesen and Dr. Täning with whom it has been my privilege to work almost from the day I joined the Council, and also Mr. Wimpenny, Chairman of the Consultative Committee, with whom I have collaborated for many years, and to whom the Council owes so much.

I am in a great debt to Dr. Fridriksson and his devoted staff for the admirable way in which they are serving the Council. The Council are fortunate in having as General Secretary a scientist of such eminence.

Finally, I must remind you here again that Madame Schmidt during my Presidency has turned a loan into a gift, as you will see from the furnishings in the President's room. She has been a true benefactress. I thank you one and all for what you have done to make my task so pleasant a one in the years which have gone by."

The Honorary President, Dr. K. A. Andersson, addressed the meeting as follows:—

"Before this meeting closes, I wish to thank you all most cordially for your kind invitation to the annual meeting of the Council. I can assure you that it gives me great pleasure to see my old friends assembled here and to follow your discussions. I wish the Council every success in the future and hope that this very old organization will set a good example for many younger and larger organizations in working always for the benefit of humanity."

Monsieur Girard then spoke as follows:—

"Dr. Kesteven very much regretted having to leave Copenhagen before the end of the meeting. He wished me to tell you that the F.A.O. is highly grateful at being given the opportunity to send its officers to take part in your technical discussions and to present papers at the committee meetings. The opportunity we have had on this occasion of describing

to you the Organization's plans for world surveys of living aquatic resources and of fishing gear has been particularly valuable. The comments which have been made on these matters in the meetings will be a most useful guide in the final formulation and implementation of our programme of work.

At this closing session of the 43rd statutory meeting allow me to thank this assembly for the very effective assistance the I.C.E.S. has once more rendered to F.A.O.

I personally have come here as observer for the General Fisheries Council for the Mediterranean and on behalf of our Chairman, Professor D'ANCONA; I desire to tell you how profitable it is for the General Fisheries Council, a new body, to take part in the meetings of your Council, which has an accumulated experience in the field of fisheries research covering more than 50 years."

Dr. KETCHEN, Canada, expressed his thanks for having been invited to attend the Council Meeting as observer.

In closing the meeting, the President thanked the U.S.S.R. delegation for the valuable gift. The Atlas of Fisheries the Council had received was reproduced in colour and was a work of art as well as of science.

The meeting terminated at 11.50 a. m.

Approved Budget for the Financial Year $^{1}/_{11}$ 1955—$^{31}/_{10}$ 1956.

EXPENDITURE

	D. Kr.	D. Kr.
I. Incidentals		
1. President	5,000.00	
2. Chairmen of Committees	20,300.00	
		25,300.00
II. Salaries		
1. General Secretary	20,000.00	
Administrative Department:—		
2. Assistant Secretary	12,780.00	
3. Assistant	9,500.00	
Publications Department:—		
4. Assistant Secretary	12,780.00	
5. Assistant	9,770.00	
Statistical Department:—		
6. Assistant Secretary	12,780.00	
Hydrographical Department:		
7. Hydrographer	20,915.00	
8. 1st Assistant	11,505.00	
9. Clerical Assistance	9,340.00	
10. Part Time Assistant	4,500.00	
11. Part Time Assistant	4,300.00	
		128,170.00
III. Office Expenses		53,500.00
IV. Travelling Expenses		10,500.00
V. Publications		100,000.00
VI. Pensions[1])		34,689.00
Estimated Excess of Income over Expenditure		42,978.00
		395,137.00

RECEIPT

	D. Kr.	D. Kr.
I. Contributions		
Belgium	20,000.00	
Denmark	20,000.00	
Finland	10,000.00	
France	40,000.00	
German Federal Republic	40,000.00	
Iceland	20,000.00	
Ireland	15,000.00	
The Netherlands	20,000.00	
Norway	20,000.00	
Poland	20,000.00	
Portugal	15,000.00	
Spain	20,000.00	
Sweden	20,000.00	
United Kingdom	40,000.00	
U.S.S.R.	40,000.00	
		360,000.00
II. Interest		
On Bank Deposits	5,000.00	
On Investments	4,513.50	
On Pension Fund	4,873.50	
		14,387.00
III. Sale of Publications		20,000.00
IV. Contribution		
from Woods Hole Oceanographic Institution towards collecting and publishing American observations for *Bulletin Hydrographique*		750.00
		395,137.00

[1]) The difference between the amount of pensions and the sum of interest yielded by the Pension Fund will be paid as a subvention to the persons concerned.

Resolutions passed by the 43rd Statutory Meeting, 1955.

Organization.

C. Res. 1955/1:

a) It was decided to dissolve the Sub-Committee on the Faroe Question, which was first established in 1938. Recent statistics showed that there was less cause for anxiety about the stocks of haddock and cod than had been felt earlier and that it had not been possible to report any significant relationship between the numbers of recruits to the commercial stocks and the size of the stocks spawning there.

It was furthermore decided that the Chairman prepare a short report to be inserted in one of the Council's publications.

b) It was resolved that the Sub-Committee on the Standardization of Zooplankton Methods be dissolved.

Publications.

C. Res. 1955/2:

a) It was agreed that the Administrative Reports be continued as before and that they should be brief, concise, and give, when necessary, cross references. It was decided that the General Secretary be authorized to edit the material sent to the Council through the Chairmen of Committees.

b) It was resolved that the provision of Synoptic Charts to members be continued free of charge and that the possibility of extending the area covered by the charts be considered by the Hydrographical Committee.

Papers submitted to the Council Meeting.

C. Res. 1955/3:

a) It was agreed that each paper submitted to the various committees of the Council should contain a synopsis of no more than 700 words to be read at the meetings. Papers distributed in advance of the Council Meeting should not be read at the meetings.

b) All papers submitted to the Council Meeting should be furnished in at least 150 copies.

Action for the Bureau.

C. Res. 1955/4:

In consequence of the lecture by Prof. FONTAINE on "The necessity of protecting the oceans against the dangers of radio-active pollution" the following recommendation was submitted to the Council, for transmission, through the usual diplomatic channels to the member states as well as to all Atomic Institutions of the United Nations:—

"The I.C.E.S. urge that the deposition in marine waters of waste products from atomic industries should be a matter for international study. The Council strongly recommend that any commission or commissions attending to the disposal of the atomic waste products should comprise scientists engaged in the study of the physics, chemistry, and biology of the sea, as well as in sub-marine geology."

Recommendation to F.A.O.

C. Res. 1955/5:

A note on the Fisheries Resources of the I.C.E.S. Area by F.A.O. was laid before the Council, which received the information on the subject with great interest. The Council recommend that all relevant information of the kind indicated be given whenever possible though it was emphasized that our knowledge as to the size of the living aquatic resources, even in the much explored North East Atlantic is very fragmentary and that a collaboration must unavoidably be of a long-term nature. It was considered that a survey of fisheries resources would be much helped if F.A.O. could implement the Recommendation of the Consultative Committee at the 1954 Meeting on the desirability of setting up a world fishery bibliographic and abstracting service.

Status of I.C.E.S.

C. Res. 1955/6:

It was resolved that the Bureau be authorized to follow up the question of I.C.E.S.'s Status.

Records of Hydrographical and Statistical Data.

C. Res. 1955/7:

a) It was decided that the collection of surface data held by the Service Hydrographique be recorded on punched cards. As a result of the generous offer made by the German Hydrographic Institute in this connexion, the expenses to be borne by the Council would be about 9,000 kr.

b) The Council resolved that a sum of kr. 1,000 be allocated for travelling expenses in connexion with this work during the current year.

c) The Council approved of the recommendation of the Statistical Committee that 1,500 kr. be allocated to meet the cost of marginal punched cards for filing statistical data relating to the effort and yield and facilitating their subsequent examination.

Appointment of Honorary President.

C. Res. 1955/8:

The Council resolved to nominate the retiring President, Mr. A. T. A. DOBSON, as Honorary President.

Special Scientific Meeting.

C. Res. 1955/9:

It was decided to hold a Special Scientific Meeting on "Herring Races", commencing on Thursday 27. September 1956 before the Council Meeting and allowing for three working days for the proceedings. Convener: Prof. A. BÜCKMANN; Reporter: Mr. B. B. PARRISH.

List of Members of Committees.

(One member, only, from each country is entitled to vote.)

Consultative Committee.

Mr. R. S. WIMPENNY, Chairman,
Dr. Å. V. TÅNING,
Dr. J. HULT,
Dr. AA. J. C. JENSEN,
Dr. J. FURNESTIN,
Dr. C. E. LUCAS,
Mr. G. ROLLEFSEN,
Mr. FINN DEVOLD,
Dr. JUAN CUESTA,
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Dr. B. HAVINGA,
Dr. G. BÖHNECKE,
E. STEEMANN NIELSEN,
Dr. J. LUNDBECK,
Dr. N. A. MACKINTOSH,
Mr. J. R. LUMBY.

Editorial Committee.

The Chairman of the Consultative Committee, the Editor of the *Journal du Conseil*, and the General Secretary.

Distant Northern Seas Committee.

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Denmark:	**Dr. Å. V. TÅNING, Chairman,**	Ireland:	Dr. A. E. J. WENT,
	Dr. PAUL M. HANSEN,	Netherlands:	Dr. B. HAVINGA,
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England:	Mr. R. S. WIMPENNY,	Poland:	Prof. Z. MULICKI,
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	Prof. J. KREY,		Prof. P. G. BORISOV.

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Hydrographical Consultant: Dr. J. B. Tait. Plankton Consultants: Dr. J. H. Fraser and Prof. T. Braarud.

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Dr. Chr. Hessle.
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Mr. K. A. Smetanin.

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Prof. H. U. Sverdrup, Chairman,
Dr. E. Leloup,
Dr. Å. V. Tåning,
Mr. B. Dinesen,
Dr. J. Cuesta,
Mr. G. J. Lienesch,
Prof. E. Halme.

Special Sub-Committees.

(Advisory) Sub-Committee for the Preparation of the Final Mean Charts.

Mr. J. R. Lumby, Chairman,
Dr. G. Dietrich,
Prof. P. Groen.

Sub-Committee on the International Geophysical Year 1957—1958.

Dr. G. Böhnecke, Chairman,
Dr. J. Eggvin,
Mr. A. Gougenheim,
Mr. J. R. Lumby,
Mr. H. Thomsen,
Mr. V. A. Lednev,
Dr. Å. V. Tåning.

Sub-Committee for Consideration of Inclusion in the *Bulletin Hydrographique* of Temperature Data collected by the Bathythermograph.

Prof. P. Groen, Chairman,
Dr. B. Kullenberg,
Mr. U. Stefánsson,
Mr. G. K. Izhevsky.

Sub-Committee for considering Standard Methods for Salinity Determination.

Mr. F. Hermann, Chairman,
Dr. K. Kalle,
Dr. F. Koczy,
Mr. W. D. Maniece,
Mr. P. Tchernia.

Liaison Committee

in connexion with the Permanent Commission of the 1946 Fisheries Convention.

The Chairman of the Consultative Committee, Chairman,
the Chairman of the Distant Northern Seas Committee,
the Chairman of the Near Northern Seas Committee,
the Chairman of the Atlantic Committee,
the Chairman of the Comparative Fishing Committee, and
the Chairman of the Gadoid Fish Committee.

List of Editors.

Rapports et Procès-Verbaux	**The General Secretary.**
Annales Biologiques	**„**
Bulletin Statistique	**„**
Bulletin Hydrographique	**The Hydrographer.**
Journal du Conseil	**Lt.-Cdr. J. R. LUMBY.**
Fiches d'Identification du Zooplancton	**Dr. J. H. FRASER, Dr. G. THORSON, Co-Editor.**

Experts engaged in Fisheries Research in the Council's Area.

Name and Title	Special Subjects	Address
Belgium.		
Leloup, E., Dr., Directeur de l'Institut d'Etudes Maritime, Ostende..	Biologie de la faune marine	31, Rue Vautier, Bruxelles.
Gilis, Ch., adjoint technique de l'Institut d'Etudes Maritime, Ostende	Recherches sur le hareng guai — le hareng plein. "Overfishing"	16, Rue du Midi, Oostende.
Denmark.		
Tåning, Å. Vedel, Dr., Director ..	Marine Biology. Oceanography. Ichthyology	Danmarks Fiskeri- og Havundersøgelser, Charlottenlund Slot, Charlottenlund.
Andersen, K. P., Mag. scient.....	Hydrography	
Andersen, Th., Cand. mag.....	Biology of freshwater fish	
Bagge, Ole, Cand. mag.....	Marine fish.....	
Bertelsen, E., Dr.	Biology of marine fish	
Boëtius, J., Mag. scient.....	Marine zoophysiology	
Grøntved, J., Mag. scient.....	Phytoplankton, northern forms	
Hansen, Vagn Kr., Cand. mag. ...	Zooplankton.....	
Hermann, F., Cand. mag.....	Hydrography	
Jensen, Aage J. C., Dr.....	Biology. Fluctuations in fishery yields	
Joensen, J., Mag. scient.	Faroe cod and halibut	
Knudsen, J., Cand. mag.	Marine fish. Molluscs.....	
Larsen, K., Cand. mag.....	Biology of salmon and trout	
Lund, S., Mag. scient.	Marine algae	
Muus, Bent J., Cand. mag.	Marine biology	
Otterstrøm, C. V., Mag. scient.....	Freshwater fish. Pollution	
Popp Madsen, K., Cand. mag.....	Marine fish.....	
Poulsen, E. M., Dr.[1]).....	Biology. Crustaceans	
Rasmussen, C. J., Cand. mag.	Freshwater fish. Eel	
Ursin, E., Mag. scient.....	Marine bottom invertebrates.....	
Steemann Nielsen, E., Prof., Dr. Advisor to D. F. H.	Phytoplankton	Danmarks farmaceutiske Højskole, Universitetsparken, Copenhagen.
Thomsen, H., Cand. mag. Advisor to D. F. H.....	Hydrography.....	Meteorologisk Institut, Ordrup per Charlottenlund.
Ege, V., Dr.....	Racial investigations. Oceanic fish..	Carlsbergfondets Dana-samlinger, Charlottenlund Slot, Charlottenlund.
Strubberg, A., Cand. mag.....	Statistics.....	Fiskeriministeriet, Borgergade 16, Copenhagen.
Hansen, P. M., Dr.....	Greenland cod	Grønlands Fiskeriundersøgelser, Charlottenlund Slot, Charlottenlund.
Nielsen, J., Cand. mag.	Greenland salmon and herring	
Smidt, E. L. B., Dr.	Greenland fish and invertebrates ...	
Kreutzmann, J.	Biology, Greenland fisheries.....	Fiskeribiologisk Laboratorium, Godthåb, Greenland.
Spärck, R., Prof., Dr., Director ...	Zoology. Oysters.....	Zoologisk Museum, Krystalgade 24, Copenhagen.
Jensen, Ad. S., Prof., Dr.....	Ichthyology. Greenland fisheries....	
Bruun, A. Fr., Dr.....	Marine biology. Oceanography	
Kirkegaard, J. B., Cand. mag.	Marine fish.....	
Thorson, G., Dr.....	Ecology of marine invertebrates ...	
Kiilerich, A., Mag. scient.....	Hydrography of Greenland waters ..	Grøndalsvej 66, Copenhagen.
Lundbak, A., Cand. mag.	Hydrography.....	Meteorologisk Institut, Toldbodvej 15, Copenhagen.
Smed, J., Mag. scient.....	Hydrography.....	International Council, Charlottenlund Slot, Charlottenlund.

[1]) *p. t.* Executive Secretary, ICNAF, Halifax, N. S., Canada.

Name and Title	Special Subjects	Address
Finland.		
Järvi, T. H., Dr., Prof.	Salmonidae. Baltic herring	Caloniusgatan 9 C, Helsinki.
Halme, E., Dr., Prof.	Plankton. Baltic herring	Byrån f. Fiskeriundersökninger, Nätholmen, Helsinki.
Ehnholm, G., Dr.		
Hurme, S.	Cyprinidae, *Esox*	
Segerstråle, S., Dr.	Bottom fauna. Crustacea	Havsforskningsinstitutets Biologiska Laboratorium, Norra Järnvägsgatan 13, Helsinki.
Purasjoki, K., Mag. phil.	Plankton. Bottom fauna	
Luther, A., Dr. Prof.	Turbellaria	
Välikangas, I., Dr., Prof.	Plankton	
Granqvist, G., Dr., Prof.	Physical oceanography	Idrottsgt. 24, Helsingfors-Tölö.
Hela, I., Prof., Director	Physical oceanography	
Simojoki, H., Dr.	Hydrology	Havsforskningsinstitutet, Observatoriegatan 2, Helsinki.
Lisitzin, Eugenie, Dr.	Physical oceanography	
Koroleff, F., Dr.	Chemistry of sea water	
Palosuo, E., Mag.	Ice investigations	
Finnila, E.-G., Mag. phil.	Chemistry of sea water	
Nordström, S., Mag. phil.	Physical oceanography	
Sjöblom, Veikko, Mag. phil.	Baltic herring	
Buch, K., Prof.	Chemistry of sea water	Rönnvägen 50, Helsinki.
Palmén, E., Prof.	Physical oceanography	Högbergsgatan 1 B, Helsinki.
France.		
Furnestin, J., Directeur de l'Institut Scientifique & Technique des Pêches Maritimes	Océanographie physique et biologique	Institut Scientifique & Technique des Pêches Maritimes, 59, Av. Raymond Poincaré, Paris (16°).
Desbrosses, P., Inspecteur Général.	Clupéidés. Thonidés	
Percier, A.	Océanographie physique et biologique	
Kurc, G.	Technologie des engins et bateaux de pêche	
	Détection des bancs de poissons	
Ancellin, J., Chef de laboratoire	Harengs. Gadidés	Laboratoire de l'Institut des Pêches, B. P. 42, Boulogne s/Mer (Pas-de-Calais).
Nédélec, C.	Scombridés. Gadidés	
Faure, L., Chef de laboratoire	Océanographie. Clupéidés	Laboratoire de Lacaze-Duthiers, Roscoff (Finistère).
Letaconnoux, R., Chef de laboratoire	Merlu, thon, sardine	74, Allée du Mail, La Rochelle (Chte Mme).
de la Tourrasse, G.	Thonidés	Musée de la Mer, Biarritz (B. P.).
Marteil, L.	Ostréiculture, mytiliculture	Place du Champ de Foire, Auray (Morb.).
Trochon, P.	Ostréiculture, mytiliculture	41, Rue du Maréchal Leclerc, La Tremblade (Chte Mme).
le Dantec, J.	Ostréiculture, mytiliculture	63, Boulevard Deganne, Arcachon (Gironde).
Fage, L., Membre de l'Institut	Biologie marine	17, Rue Pierre Nicole, Paris.
le Danois, E., Ancien Directeur de l'Institut Scientifique & Technique des Pêches Maritimes	Océanographie. Biologie marine	3, Rue Quinault, Saint-Germain en Laye (S. & O.).
Coupé, R.	Sparidés	Institut Scientifique des Pêches Maritimes, Casablanca, Maroc.
Maurin, Ch.	Gadidés	
Dardignac, J.	Sciénidés	
Vincent, A.	Triglidés	
Bouxin, H.	Ecologie marine. Plancton littoral	Laboratoire Maritime du Collège de France, Concarneau (Finistère).
Drach, P., Professeur à la Faculté des Sciences, Paris	Crustacés. Ecologie néritique	Station Biologique, Roscoff (Finistère).
Cadenat, J.	Systématique et biologie des poissons. Echinodermes	Laboratoire de Biologie Marine de Gorée, Dakar (Sénégal).
Monod, T., Directeur	Crustacés et poissons	Institut Français d'Afrique Noire, Dakar (Sénégal).
Dyèvre, H., Directeur	Océanographie physique. Hydrographie	Service Hydrographique de la Marine, 13, Rue de l'Université, Paris.
Gougenheim, A.	Océanographie physique. Hydrologie	
Bertin, L., Professeur du Mus. Nat. Hist. Natur.	Océanographie, poissons apodes et leptocéphales, poissons abyssaux	57, Rue Cuvier, Paris.
Teissier, G., Professeur à la Faculté des Sciences	Biologie marine	1, Rue Victor Cousin, Paris.
Prenant, M., Professeur à la Faculté des Sciences	Biologie marine. Physiologie	

Name and Title	Special Subjects	Address
France (continued).		
Fontaine, M.	Physiologie des poissons migrateurs	25, Rue Pierre-Nicole, Paris.
Vivier, R.	Poissons migrateurs	Ministère de l'Agriculture, 1 ter, Avenue de Lowendal, Paris.
Vibert, R.	Saumon, truite	Musée de la Mer, Biarritz (B. P.).
Germany.		
Bückmann, Prof. Dr. A., Director	Fishery biology	Biologische Anstalt Helgoland, List auf Sylt, und Hamburg-Grossflottbek, Elbchaussee 199.
Aurich, Dr. H.	Plankton. Fish fry	
Gillbricht, Dr. M.	Plankton productivity	
Hempel, Dr. G.	Fishery biology. Fish fry	
Kornmann, Prof. Dr. P.	Botany. Algae	
Messtorff, Dipl. Biol., J.	Fishery biology	
Reimer, Dr. H.	Fishery biology. Hydrography	
Werner, Dr. B.	Zoology. Molluscs	
Ziegelmeier, Dr. E.	Bottom animals. Hydroids	
Kotthaus, Dr. A.	Fishery biology and statistics	Biologische Anstalt Helgoland, Abt. Fischereibiologie, Bremerhaven-F., F. A.-Pust-Platz.
Schmidt, Dr. U.	Fishery biology and statistics	
Ludorff, Dr. W., Dir. u. Prof., Institutsleiter	Chemistry	Bundesforschungsanstalt für Fischerei, Institut für Fischverarbeitung, Hamburg-Altona, Elbchaussee 92.
Hennings, Dr. Chr.	Physical chemistry	
Hutschenreuter, Dr. R.	Technological research of fishery production	
Junker, Dr. M.	Physiology	
Kreuzer, Dr. R.	Bacteriology	
Wünsche, Dr. G.	Chemistry	
Meyer-Waarden, Dr. P. F., Dir. u. Prof., Institutsleiter	Inshore fisheries. Electric fishing	Bundesforschungsanstalt für Fischerei, Institut für Küsten- und Binnenfischerei, Hamburg 36, Neuer Wall 72.
Halsband, Dr. E.	Electric fishing	
Kühl, Dr. H.	Hydrobiology. Fouling	
Mann, Dr. H.	Inshore fisheries. Physiology	
Ranke, Dipl. Biol., B.	Chemistry of fishes	
Ranke, Dipl. Biol., E.	Chemistry of fishes	
Tiews, Dr. K.	Inshore fisheries. Tuna	
v. Brandt, Dr. A., Institutsleiter	Fishing implements. Preserving of fish nets	Bundesforschungsanstalt für Fischerei, Institut für Netz- und Materialforschung, Hamburg 36, Neuer Wall 72.
Klust, Dr. G.	Fishing implements. Preserving of nets	
Schärfe, Dr. J.	Behaviour of fishes	
Lundbeck, Dr. J., Dir. u. Prof., Institutsleiter	Fishery biology. Statistics	Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Hamburg 36, Neuer Wall 72.
Schnakenbeck, Prof. Dr. W.	Fishery biology	
Krefft, Dr. G.	Fishery biology. Herring. Ichthyology	
Meyer, Dr. A.	Fishery biology. Cod	
Sahrhage, Dr. D.	Fishery biology	
Schubert, Dr. K.	Fishery biology. Herring. Whaling	
Wulff, Dr. A.	Fishery biology. Plankton	
Böhnecke, Dr. G., President	Hydrography	Deutsches Hydrographisches Institut, Hamburg 4, Bernhard-Nocht-Str. 78.
Dietrich, Dr. G.	Hydrography	
Goedecke, Dr. E.	Hydrography	
Hansen, Dr. W.	Hydrodynamics	
Jarke, Dr. G.	Sediments	
Joseph, Dr. J.	Hydrography	
Kalle, Prof. Dr. K.	Marine chemistry	
Krauss, Dr. W.	Hydrography	
Neumann, Dr. H.	Oceanographical observations	
Sendner, H.	Oceanographical methods	
Stocks, Prof. Dr. Th.	Topography of bottom	
Weidemann, Dr. H.	Hydrography	
Wohlenberg, Dr. E.	Ecology of coast	Forschungsstelle Westküste, Husum, Nissenhaus.
König, Dr. D.	Ecology of coast	
Schäfer, Dr. W.	Ecology of benthos	Forschungsinstitut "Senckenberg am Meer", Wilhelmshaven, Schleuseninsel.

Name and Title	Special Subjects	Address
Germany (continued).		
Friedrich, Prof. Dr. H., Director...	Marine ecology	Institut für Meeresforschung, Bremerhaven-G., Am Handelshafen 12.
Brandes, Dr. C. H.	Plankton, Parasitology of marine fishes	
Dietrich, Dr. R.	Chemistry of fishes	
Höhnk, Dr. W.	Marine fungi	
Lüneburg, Dr. H.	Hydrography. Marine chemistry, especially estuaries	
Wüst, Prof. Dr. G., Director	Physical oceanography	Institut für Meereskunde der Universität Kiel, Kiel, Hohenbergstr. 2.
Hoffmann, Prof. Dr. C.	Botany	
Kändler, Prof. Dr. R.	Fishery biology	
Krey, Prof. Dr. J.	Plankton productivity	
Lühmann, Dr. M.	Fishery biology	
Schlieper, Prof. Dr. C.	Zoology. Physiology	
Noodt, Dr. E.	Hydrography	
Harder, Dr. W.	Behaviour of fish and plankton. Anatomy	Institut für Fischereibiologie der Universität Hamburg, Hamburg 36, Holstenwall 24.
Kosswig, Prof. Dr. C., Director	Hydrobiology	Zoologisches Staatsinstitut, Hamburg 13, Bornplatz 5.
Caspers, Prof. Dr. H.	Hydrobiology	
Remane, Prof. Dr. A., Director	Zoology	Zoologisches Institut der Universität Kiel, Kiel, Hegewischstr. 3.
Schulz, Dr. E.	Ecology of bottom fauna	
Great Britain.		
England.		
Graham, M., C. M. G., O. B. E., M. A.	Population studies of fish stocks	Fisheries Laboratory, Lowestoft.
Beverton, R. J. H., M. A.	Population studies of demersal fish stocks	
Gulland, J. A., B. A.	Population studies of demersal fish stocks	
Margetts, A. R., M. A.	Comparative fishing. Fish migrations	
Wimpenny, R. S., M. Sc.	Plankton ecology. Plaice biology	
Lumby, J. R., Lt.-Cdr.	Hydrography	
Lee, A. J., B. A.	Hydrography (Arctic)	
Vaux, D., B. Sc.	Hydrography (Near Waters)	
Richardson, I. D., B. Sc.	Pelagic fish	
Bolster, G. C., B. A.	Pelagic fish	
Burd, A. C., B. Sc.	Pelagic fish	
Cattley, J. G., M. Sc.	Zooplankton	
Cushing, D. H., Dr.	Plankton studies. Echo-sounding	
Trout, G. C., B. Sc.	Arctic cod and haddock	
Corlett, J., M. Sc.	Arctic plankton	
Blacker, R. W., B. Sc.	Arctic benthos	
Harden-Jones, F. R., Dr.	Fish behaviour	
Birkett, L., B. Sc.	North Sea benthos. Hake biology	
Shelbourne, J. E., B. Sc.	Biology of fish eggs and larvae	
Hodgson, W. C., Dr.	Pelagic fish	50, Kirkley Park Road, Lowestoft.
Russell, F. S., F. R. S.	Zooplankton. Hydromedusae	Marine Biological Association, Citadel Hill, Plymouth.
Corbin, P. G., B. A.	Zooplankton. Fishes	
Harvey, H. W., Dr., F. R. S.	Fertility and chemical constitution of sea water	
Steven, G. A., Dr.	Fish, fisheries and bottom fauna	
Wilson, D. P., Dr.	Ecology of larval development and settlement. Marine aquaria	
Cooper, L. H. N., Dr.	Chemical and physical oceanography	
Spooner, G. M., M. A.	Shore ecology. Amphipods, isopods, insects	
Parke, Mary, W., Dr.	Algae	
Ballantine, D., Miss, B. Sc.	Algae	
Alexandrowicz, J. S., Dr.	Muscle receptor elements and heart inervation in crustaceans	
Abbott, B. C., Dr.	Biophysics of marine organisms	
Nicol, J. A. C., Dr.	Physiology of marine animals. Luminescence	

Name and Title	Special Subjects	Address
Great Britain (continued).		
Holme, N. A., M. A.	Bottom fauna. Lamellibranchs	Marine Biological Association, Citadel Hill, Plymouth.
Carlisle, D. B., Dr.	Endocrinology of marine animals. Ascidians	
Forster, G. R., B. Sc.	Underwater studies of rock fauna	
Armstrong, F. A. J.	Chemical oceanography	
Hardy, A. C., Prof., F. R. S.	Fisheries and plankton	Department of Zoology, Oxford University, Oxford.
Mackintosh, N. A., Dr.	Whaling research	The National Institute of Oceanography, Wormley, Nr. Godalming, Surrey.
Carruthers, J. N., Dr.	Hydrography	
Cole, H. A., Dr.	Inshore and shellfish research	Fisheries Laboratory, Burnham-on-Crouch, Essex.
Butcher, R. W., Dr.	Systematics of nanoplankton algae	
Waugh, G. D., B. Sc.	Oyster production	
Mistakidis, M. N., B. Sc.	Prawns and shrimps	
Hancock, D. A., B. Sc.	Oyster pests. White weed	
Wood, P. C., B. Sc.	Sanitary control. Oyster cleansings	
Hepper, B. T., B. Sc.	*Mytilicola*. Mussel culture	
Simpson, A. C., B. Sc.	Lobster research	Fisheries Experiment Station, Conway, Caernarvonshire.
Reynolds, N., Dr.	Sanitary control. Mussel cleansing	
Walne, P. R., B. Sc.	Oyster rearing	
Crisp, D. J., Dr.	Cirripedes	Marine Biol. Stat., University College of North Wales, Bangor, Caernarvonshire.
Knight-Jones, E. W., Dr.	Marine invertebrate larvae	
Spencer, C. P., Dr.	Algal biochemistry	
Jones, W. E.	Algal ecology	
Burdon-Jones, C., Dr.	Protochordata embryology	Department of Zoology, University College of North Wales, Aberystwyth.
Jones, W. C., M. A.	Physiology of sponges	
Erichsen Jones, J., Dr.	Toxicity of metallic salts to fish	
Frost, W. E., Dr.	Eel, salmon and sea trout	Freshwater Biol. Assoc., The Ferry House, Far Sawrey, Ambleside, Westmorland.
le Cren, E. D., M. A.	Trout, sea trout and salmon	
Colman, J. S., M. A.	Shore ecology. Chaetognaths	Marine Biol. Stat. (University of Liverpool), Port Erin, Isle of Man.
Bruce, J. R., M. Sc.	Manx marine fauna	
Jones, N. S., Dr.	Benthos and fish food	
Williamson, D. I., Dr.	Zooplankton	
Bowers, A. B., B. Sc.	Fish and fisheries	
Slinn, D. J., B. Sc.	Hydrography. Fish parasites	
Kain, Joanna, Dr.	Algology	
Jones, J. W., Dr.	Sex in salmon	Department of Zoology, The University, Liverpool.
Crofton, H. O., Dr.	Parasitism in trout	The University, Bristol.
Spaul, E. A., Prof.	Parasitism in fish	Department of Zoology, The University, Leeds.
Hobson, A. D., Prof., F. R. S. E.	General marine zoology. Parasitology	King's College, University of Durham, The Dove Marine Laboratory, Cullercoasts, Northumberland.
Bull, H. O., Dr.	Fish behaviour. General marine fauna	
Bossanyi, J., B. A.	Plankton. Benthos relationships	
Allen, J. A., B. Sc.	Mollusca, inshore	
Evans, F., B. Sc.	Mollusca, inshore	
Pentelow, F. T. K., M. A.	Salmon investigations	Ministry of Agriculture, Fisheries & Food, Whitehall Place, London, S.W. 1.
Allan, I. R. H., B. A.	Salmon investigations	
Hartley, W. G., B. Sc.	Salmon investigations	
Swain, A., B. Sc.	Salmon investigations	
Alabaster, J. S., B. Sc.	Salmon investigations	
Gervers, F. W. K., B. Sc.	Salmon investigations	
Scotland.		
Lucas, C. E., Dr., F. R. S. E., Director	Marine biology. Plankton	Scottish Home Department, Marine Laboratory, Victoria Road, Torry, Aberdeen.
Wood, H., Dr., F. R. S. E., Deputy Director	Herring	
Baxter, I. G., B. Sc.	Herring	
Blaxter, J. H. S., B. A.	Herring	
Craig, R. E., B. Sc.	Physics. Hydrography	
Dickson, W., B. Sc.	Fisheries engineering	
Fraser, J. H., Dr., F. R. S. E.	Plankton	
Johnston, R., Dr.	Marine chemistry	
Jones, R., B. Sc.	Haddock	
McIntyre, A. D., B. Sc.	Halibut. Bottom fauna	

Name and Title	Special Subjects	Address
Great Britain (continued).		
Parrish, B. B., B. Sc.	Herring	Scottish Home Department, Marine Laboratory, Victoria Road, Torry, Aberdeen.
Pope, J. A., M. A.	Statistics	
Rae, B. B., Dr.	Flatfish	
Ritchie, A., Dr., F. R. S. E.	Seining	
Saville, A., B. Sc.	Plankton (fish eggs and larvae)	
Steele, J. H., B. Sc.	Hydrography	
Tait, J. B., Dr., F. R. S. E.	Hydrography	
Thomas, H. J., Dr.	Bottom fauna. Crustacea	
Pyefinch, K. A., M. A., F. R. S. E., Officer-in-Charge	Salmon, trout and zooplankton	Scottish Home Department, Brown Trout Laboratory, Pitlochry, Scotland.
Stuart, T. A., B. Sc.	Trout	
Brook, A. J., B. Sc., Ph. D.	Botany, Phytoplankton	
Holden, A. V., B. A.	Freshwater chemistry	
Munro, W. R., B. Sc.	Trout	
Morgan, N. C., B. Sc.	Bottom fauna (freshwater)	
MacFarlane, P. R. C., B. Sc., Chief Inspector Salmon Fisheries	Salmon	Scottish Home Department, St. Andrew's House, Edinburgh, 1.
Rae, K. S. M., O. B. E., B. Sc., F. R. S. E., Officer-in-Charge	Plankton	Scottish Marine Biological Association, Oceanographic Laboratory, 78, Craighall Road, Edinburg, 5.
Henderson, G. T. D., D. S. C., Ph. D., F. R. S. E.	Plankton	
Rees, C. B., D. Sc.	Plankton	
Glover, R. S., B. Sc.	Plankton	
Vane, F. R., M. Sc.	Plankton	
Robinson, G. A., M. A.	Plankton	
Mills, D. H., B. Sc.	Plankton	
Ford, E., A. R. C. S., D. I. C., F. R. S. E., Director	Fish	
Orr, A. P., D. Sc., A. R. I. C., F. R. S. E., Deputy Director	Plankton	
Marshall, S. M., (Miss), D. Sc., F. R. S. E.	Plankton	
Barnes, H., D. Sc., F. R. I. C.	Oceanography. Biochemistry	Scottish Marine Biological Association, Marine Station, Millport, Isle of Cumbrae.
Pike, R. B., Ph. D.	Crustacea	
Millar, R. H., Ph. D.	Oysters. Ascidians	
Droop, M. R., Ph. D.	Microbiology	
Powell, H. T., B. Sc.	Algology	
Bagenal, T. B., B. A.	Fish	
Stephen, A. C., Dr., F. R. S. E.	Marine bottom fauna. British cephalopods	Royal Scottish Museum, Edinburgh.
Friend, G. F., M. A., B. Sc., F. R. S. E.	Ecology, morphometrics and systematics of salmonid fish and their copepod parasites	Zoology Department, Edinburgh University.
Yonge, C. M., Prof., F. R. S.	Mollusca. Crustacea. Madreporaria	
Owen, G., B. Sc.	Mollusca	
Beedham, G. E., B. Sc.	Mollusca	
Slack, H. D., Dr.	Freshwater biology	Zoology Department, Glasgow University.
Hunter, W. Russell, Dr.	Freshwater biology	
Hamilton, J. D., B. Sc.	Freshwater biology	
Conway, E., Mrs., Dr.	Marine foreshore ecology	Botany Department, Glasgow University.
Wynne-Edwards, V. C., Prof., F. R. S. E., F. R. S. C.	Freshwater fish	Natural History Department, Aberdeen University.
Neill, R. M., Dr., F. R. S. E.	Salmon	
Orkin, P. A., Dr.	Elasmobranchs	
Dodd, J. M., B. Sc., Ph. D.	Shore fauna and endocrinology of lower chordates	
Arnold, D. C., M. A., B. Sc.	Oecology of bottom-living marine organisms	Gatty Marine Laboratory and Zoology Department, St. Andrews University.
Goddard, C. K., B. Sc.	Endocrinology of elasmobranch fishes	
Blackler, M. C. H., B. Sc. Ph. D.	Marine algology	

Name and Title	Special Subjects	Address
Iceland.		
Friðriksson, Á., Dr., General Secretary	Herring. Statistics	I. C. E. S., Charlottenlund, Denmark.
Jónsson, J., Mag. scient., Director	Cod	Atvinnudeild Háskólans, Borgartun 7, Reykjavik.
Einarsson, H., Dr.	Zooplankton	
Stefánsson, U., Mag. scient.	Hydrography. Chemistry of sea water	
Sigurðsson, A., Mag. scient.	Flatfish. Marine bottom invertebrates	
Hallgrímsson, I., Mag. scient.	Zooplankton	
Magnússon, J., Dr.	Redfish	
Óskarsson, I.	Cod. Age determination. Marine molluscs	
Jónsson, E.	Herring. Age determination	
Guðjónsson, Th., Mag. scient. Inspector of Freshwater Fisheries	Salmon and trout	Tjarnargata 10, Reykjavik.
Jónasson, P., Mag. scient.	Limnology	Universitetets ferskvandsbiologiske Laboratorium, Hillerød, Denmark.
Ireland.		
Went, A. E. J., D. Sc., Ph. D., Inspector of Fisheries and Scientific Advisor	Salmon and trout. History of fishing methods	Department of Agriculture, Fisheries Branch, 3, Cathal Bruga Street, Dublin.
Toner, E. D., M. Sc., Assistant Inspector	Herring. Oyster	
Gibson, F. A., Ph. D., Assistant Inspector	Sprat, Salmon and Escallops	
Norman, Hazel, Mrs., M. Sc., Biologist	Salmon. Whiting	
Healy, Anne, Miss, Ph. D., Technical Assistant	Brown trout. Other freshwater fish	
Twomey, Eileen, Miss, M. Sc., Biologist	Brown trout	
Humphries, Carmel, Ph. D.	Trout	University College, Dublin.
Poole, H. H., Sc. D., Registrar	Submarine illumination	Royal Dublin Society, Ballsbridge, Dublin.
Netherlands.		
Havinga, B., Dr., Director	Coordination of fishery investigations	Rijksinstituut voor Visserij-onderzoek, Haringkade 1, IJmuiden.
Boerema, L. K.	North Sea Fisheries	
Deelder, C. L., Dr.	Yssel-Lake and migration of fishes in inshore waters	
Roessingh, M.	North Sea fisheries	
Roskam, R. Th.	Chemistry and bacteriology of fish preservation, especially canning	
Willemsen, J.	Freshwater fisheries. Fish rearing	
Zijlstra, J. J.	Herring investigations	
Korringa, P., Dr.	Oyster and mussel culture	Rijksinstituut voor Visserij-onderzoek, Bergen op Zoom.
Drinkwaard, A. C.	Oyster culture	Rijksinstituut voor Visserij-onderzoek, Wemeldinge.
Vlasblom, A. G.	Oyster culture	
Baerends, G. P., Dr., Professor	Herring investigations	Zoological Laboratory, Haren (Gr.).
Reuter, J., Dr.	Preserving of fish nets	Visserij-Proefstation, Maliebaan 103, Utrecht.
Grijns, A., Dr.	Bacteriology. Oyster and mussel cleansing	Lab. Bestuur der Visserijen op de Zeeuwse Stromen, Bergen op Zoom.
v. Mameren, J.	Technological research of fishery products	Central Instituut voor Voedingsonderzoek, Haringkade 1, IJmuiden.
Luypen, A. F. M.	Technological research of fishery products	
Termijtelen, J. W., Vice-Admiral, Director	Hydrography	Kon. Nederlandse Meteorol. Inst., Oceanografische afd., De Bilt.
Groen, P., Dr., Professor	Hydrography	
Verwey, J., Dr., Director	Marine ecology	Zoölogisch Station, Den Helder.
Kristensen, I.	Marine ecology	
Postma, H., Dr.	Chemical oceanography	
Westenberg, J., Dr.	Theoretical biology	

Name and Title	Special Subjects	Address
Norway.		
Rollefsen, G., Director	Cod	Fiskeridirektoratets Havforskningsinstitutt, Postboks 226, Bergen.
Aasen, O.	Herring. Marking experiments	
Berge, G.	Phytoplankton. Production	
Bratberg, E.	Redfish	
Dannevig, G.	Sprat. Marking experiments on cod	
Devold, F.	Herring	
Dragesund, O.	Herring	
Eggvin, J., Dr.	Physical oceanography	
Gundersen, K.	Zooplankton	
Ljøen, R.	Physical oceanography	
Midttun, L.	Physical oceanography	
Olsen, S.	Saithe	
Rasmussen, B.	Prawn. Seal. Arctic questions	
Rasmussen, Tu.	Herring. Age determination	
Revheim, A.	Mackerel	
Sundnes, G.	Physiology of fish	
Sætersdal, G.	Cod	
Wiborg, K. F., Dr.	Zooplankton. Mussel	
Ostvedt, O.-J.	Herring	
Beyer, F.	Zooplankton	Universitetets Biologiske Laboratorium, Frederiksgate 3, Oslo.
Foyn, E., Dr.	Chemistry of sea water	
Hylen, A.	Population dynamics	
Lea, E.	Herring research. Fish tags	
Sømme, Olaug M., Mrs.	Marine bacteriology	
Ruud, Johan T., Dr., Prof., Director	Whaling research. Zooplankton	Statens Institutt for Hvalforskning, Frederiksgate 3, Oslo.
Jonsgaard, Å.	Whale biology	
Pedersen, T.	Chemistry of whale oils	
Braarud, T., Dr., Prof.	Phytoplankton ecology and taxonomy	Institutt for Marin Biologi, Avd. A, Oslo, Blindern.
Gaarder, Karen R., Mrs.	Phytoplankton ecology and taxonomy	
Halldal, Per	Phytoplankton physiology and ecology	
Sverdrup, H. U., Prof., Ph. D., Ll. D., Director	Physical oceanography	Norsk Polarinstitutt, Observatoriegaten 1, Oslo.
Dannevig, Alf, Dr.	Hatching and rearing of marine fish and lobster. Fish eggs and larvae	Statens Utklekningsanstalt, Flødevigen, Arendal.
Dannevig, Eva Henly, Mag. scient.	Physiology and bacteriology	
Hansen, S.	Rearing of marine fish	
Loversen, R.	Investigations of 0-group gadoid fish. Marking experiments	
Otterbech, F., Cand. real.	Eggs and larvae of marine fish. Tagging experiments. Oyster culture	
Mosby, H., Dr., Prof.	Physical oceanography	Geofysisk Institutt, Allégaten 70, Bergen.
Sælen, Odd H.	Physical oceanography	
Løkensgard, T.	Growth analysis. Biology of pike	Landbruksdepartementet, Oslo.
Jensen, K. W.	Cultivation of forest lakes. Feeding of trout fry	Ferskvannsfisket, Vitensk. Avd., Sarsgate 1, Oslo.
Rosseland, L.	Biology of salmon and trout	
Sømme, S.	Biology of salmon and sea trout	Eksveien 19, Røa.
Sivertsen, E., Dr.	Biology of eel. Seal	Trondheim Museum, Trondheim.
Rustad, D.	Hatching and rearing of plaice. Marine biology	Biologisk Stasjon, Trondheim.
Berg, M.	Fish food, esp. in lakes	Tromsø Museum, Tromsø.
Fjeldstad, E. J., Dr., Prof.	Physical oceanography	Oseanografisk Institutt, Universitetet Blindern, Oslo.
Brattström, H., Dr., Prof.	Marine ecology	Universitetet i Bergen, Biologisk Stasjon, Espegrend.
Tambs Lyche, H.	Marine ecology	
Poland.		
Cieglewicz, W., Dr., Prof., Director	Marine biology	Sea Fisheries Institute, Gdynia.
Demel, K., Dr., Prof.	Marine biology. Benthos	
Mańkowski, W., Dr., Prof.	Marine biology. Plankton	
Mulicki, Z., Dr., Prof.	Bottom fauna. Ecology	
Churzan, F., Dr., Prof.	Salmonidae	

Name and Title	Special Subjects	Address
Poland (continued).		
Popiel, J., Dr.	Herring	Sea Fisheries Institute, Gdynia.
Rutkowicz, S., Mgr.	Cod	
Laszczyński, S., Mgr.	Economy	
Elwertowski, J., Mgr.	Sprat	
Reimann, Z., Mgr.	Flatfish	
Żukowski, Cz., Inz.	Freshwater fish	
Filuk, J., Mgr.	Freshwater fish	
Strzyzewska, K.	Fish food	
Romański, Mgr.	Fish culture	
Janko, H., Inz.	Fishing grounds	
Klimaj, A., Inz.	Fishing grounds	
Ciszewski, P., Mgr.	Zooplankton	
Wiktor, J., Mgr.	Biology. Ichthyology	
Wiktor, K., Dr.	Zooplankton	
Ringer, Z.	Algae	
Zembrzuska, D., Mgr.	Phytoplankton	
Zmudziński, L., Inz.	Bottom fauna	
Kujawa, S.	Zoology	
Glowinska, A.	Hydrography	
Filarski, J.	Hydrography	
Zebrowski, Z., Kpt.	Fishing gear	
Okoński, S., Inz.	Fishing gear	
Portugal.		
Candeias, A.	Plancton (Copépodes)	Instituto de Biologia Maritima, Cais do Sodré, Lisboa.
Pinto, J. dos Santos	Poissons (Clupéidés)	
Ramalho, A. M.	Poissons (Clupéidés)	
Ruivo, M.	Poissons (Clupéidés). Océanographie biologique	
Cumano, H. B.	Echinodermes	Faculdade de Ciências (Zoologia), Lisboa.
Nunes-Ruivo, Lidia, Mme	Copépodes parasites. Crustacés	
Ricardo Jorge, A., Prof.	Zoologie (Vermes)	
Sacarrao, G.	Céphalopodes (Embryologie)	
Frade, F., Prof.	Poissons (Thonidés)	Centro de Zoologia, Rua da Junqueira 14, Lisboa.
Marques, Emerita, Mme	Copépodes	
Franca, P. da	Poissons (Merlus)	Missao de Biologia Maritima, Largo do Figueiredo 1, Lisboa.
Monteiro, R.	Poissons	
Silva, Estela, Mme	Phytoplancton	
Vilela, H.	Crustacés et mollusques	
Cruz, J. M.	Clupéidés	Faculdade de Ciências (Zoologia), Porto.
Russia.		
Dmitriev, N. A., Prof.	Control of fisheries (the Baltic)	Institute of Marine Fisheries and Oceanography of the U.S.S.R. (VNIRO), Verkhne-Krasnoselskaja 17, Moscow, B. 140.
Bolotnova, O. S., Mrs.	Statistics and economics of trawl fisheries in the North Atlantic	
Borodatov, V. A.	Commercial fish of Distant Northern Seas	
Dementjeva, T. F., Mrs.	Clupeidae and cod of the Baltic	
Dorofeev, S. V., Prof.	Marine mammals of the North Atlantic	
Fedosov, M. V.	Hydrochemistry. Problems of the International Geophysical Year	
Gorshkova, T. I., Mrs.	Bathymetry and floors of the Baltic and the Distant Northern Seas	
Izhevsky, G. K.	Fisheries oceanography	
Karpevich, A. F., Dr.	Acclimatization	
Kireeva, M. S., Mrs.	Algae of the Barents Sea and the White Sea	
Manteufel, B. P., Prof.	Plankton. Atlantic herring. Behaviour of fish	
Mesjachenko, V. T.	Preservation of fishing nets	
Moiseev, P. A., Prof.	Fish	
Naumov, V. M.	Commercial fish of the North Sea and the Baltic	

Name and Title	Special Subjects	Address
Russia (continued).		
Protasov, A. A.	Reproduction of salmonid fish	Institute of Marine Fisheries and Oceanography of the U.S.S.R. (VNIRO), Verkhne-Krasnoselskaja 17, Moscow, B. 140.
Shein, A. S., Engineer	Hydroacoustics	
Smetanin, K. A.	Economical investigations of the North Atlantic fisheries	
Tokarev, A. K.	Biology of herring in the North Atlantic	
Treschev, A. I.	Techniques of commercial fisheries	
Vinogradova, E. G., Mrs.	Hydrochemistry of the Distant Northern Seas	
Zaitsev, G. N.	Dynamics of water masses of the Distant Northern Seas	
Jashnov, V. A., Prof.	Zooplankton of northern seas	Faculty of Biology and Paedology, Moscow State University.
Nikolsky, G. V., Corr. Mem. Acad. Sci. U.S.S.R.	Biology of fish. Salmonids. Theoretical research of fisheries	
Zenkevich, L. A., Corr. Mem. Acad. Sci. U.S.S.R.	Invertebrates	
Zatsepin, V. I.	Benthos of the Barents Sea	
Dobrovolsky, A. D., Prof.	Hydrology of the North Atlantic	Faculty of Geography, Moscow State University.
Zubov, N. N., Prof., Rear-Admiral	Hydrology of the Polar Basin and adjacent seas	
Kryzhanovsky, S. G., Dr.	Morphology of fish	Institute of Animal Morphology, Academy of Sciences of the U.S.S.R., Bolshaja Kaluzhskaja Ul. 33, Moscow, D-1.
Borsukov, V. V.	Fish	
Radakov, D. V.	Commercial fish of the North Sea. Behaviour of fish	
Kriss, A. E., Prof.	Distribution of microorganisms in northern seas	Institute of Microbiology, Academy of Sciences of the U.S.S.R., Bolshaja Kaluzhskaja Ul. 33, Moscow, D-1.
Bogorov, B. G., Prof.	Plankton of the North Atlantic	Institute of Oceanography, Academy of Sciences of the U.S.S.R. (IOAN), Luzhnikovskaja 8, Moscow.
Klenova, M. V., Prof., Mrs.	Marine geology	
Rass, T. S., Prof.	Morphology and embryology of fish	
Borisov, P. G., Prof.	Fishery research in the Baltic	Moscow Technical Institute of Fisheries (Mosrybvtuz), Prjanishnikova Ul. 2, Moscow, D-8.
Bogdanov, A. S.	Fishery research	
Lednev, V. A.	Hydrography of the North Atlantic	State Oceanographical Institute (GOIN), Kropotkinskij pereulok 6, Moscow.
Andrijashev, A. P., Prof.	Fish of northern seas	Institute of Zoology, Academy of Sciences of the U.S.S.R. (ZIN), Birzhevaja linija 1, Leningrad.
Svetovidov, A. N., Corr. Mem. Acad. Sci. U.S.S.R.	Clupeidae. Gadidae	
Preobrazhensky, Ju. V.	Hydrology of the Baltic	State Oceanographical Institute, Leningrad Department, Leningrad.
Soskin, I. M.	Water masses of the Baltic	
Ivlev, V. S., Prof.	Productivity of water	Institute of Freshwater Fisheries of the U.S.S.R. (VNIORKH), Smolnaja Ul. 3, Leningrad.
Telegin, K. F.	Clupeidae of the Gulf of Finland	
Rannak, L. A.	Clupeidae of the northern Baltic	Laboratory of Commercial Ichthyology, Baltic Institute of Marine Fisheries and Oceanography, Apteegy 1/2, Tallin.
Lishev, M. N.	Behaviour of fish	Laboratory of Ichthyology, Baltic Institute of Marine Fisheries and Oceanography, Bezdeligu 1, Riga.
Nikolaev, I. I.	Plankton of the Baltic	
Gasjunas	Hydrobiology of the Baltic Sea Gulfs	Institute of Biology, Academy of Sciences of Lithuanian S.S.R., Vilnius.
Birjukov, N. P.	Fish of the Baltic	Baltic Institute of Marine Fisheries and Oceanography, Kaliningrad.
Petelin, P. V.	Techniques of commercial fisheries	
Marty, Ju. Ju., Dr.	Clupeidae of the North Atlantic	Polar Institute of Marine Fisheries and Oceanography (PINRO), Murmansk.
Adrov, M. M.	Hydrology of the Norvegian Sea	
Alekseev, A. P.	Thermics of the Distant Northern Seas	
Judanov, I. G.	Clupeidae of the North Atlantic	
Lagunov, I. I.	Salmonids of the Barents Sea and the White Sea	

Name and Title	Special Subjects	Address
Russia (continued).		
Maslov, N. A.	Fish of the Barents Sea	Polar Institute af Marine Fisheries and Oceanography (PINRO), Murmansk.
Pavshtiks, E. A.	Plankton of the northern North Atlantic	
Sedykh, K. A.	Thermics of the Barents Sea	
Starovojtov, P. A.	Techniques of commercial fisheries	
Travin, V. I.	Biology of *Sebastes marinus* (L.)	
Vinogradova, P. S., Mrs.	Bathymetry and floors of the Barents Sea and the Distant Northern Seas	
Kamshilov, M. M., Prof.	Benthos of the Barents Sea	Biological Station of the Academy of Sciences of the U.S.S.R., Dalnie Zelentsy, Murmansk.
Gemp, K. P.	Algae of northern seas	Algal Laboratory, Institute of Marine Fisheries and Oceanography of the U.S.S.R., Arkhangelsk.
Palenichko, Z. G.	Fishery investigations in the White Sea	White Sea Biological Station, Petrozavodsk.
Spain.		
Garoia-Rodriguez, R., Contre-Amiral, Directeur Général	Océanographie	Instituto Español de Oceanografía, Alcalá 27, Madrid.
Navarro, F., Sous-Directeur, Chef du Dept. de Biologie	Clupéidés	
Lozano Rey, L., Prof. Agrégé	Ichthyologie	
Navarro, M. G. de, Mme	Ichthyologie	
Montequi, R., Prof., Chef du Dept. de Chimie Appl.	Chimie appliquée	
Aravio-Torre, J.	Chimie algologique	
Garcia-Pineda, M. D., Dr., Mlle	Biochimie	
Jimeno, E., Prof., Chef du Dept. de Chimie Physique	Chimie physique	
Arevalo, A.	Chimie physique	
Menendez, N., Prof., Chef du Dept. d'Océanographie Physique	Océanographie physique	
Seco, E.	Courants marins	
Gonzales-Sabariego, M. L., Mlle	Facteurs océanographiques	
Blanco, J., Dr.	Maréographes	
Hernandez-Pacheco, F., Prof.	Morphologie. Sédiments	
Rodriguez, O., Dr.	Biologie marine	Dirección Gral. de Pesca, Alarcon 1, Madrid.
Balén, F., Capitaine de Vaisseau, Directeur	Hydrographie	Instituto Hidrográfico de Marina, Cadiz.
Navaz, J. M., Directeur	Ichthyologie. Mollusques	Sociedad Oceanográfica de Guipúzcoa, Palacio del Mar, Acuario, San Sebastián.
Llarena, J. G. de, Prof.	Géologie. Sédiments	
Cuesta, J., Directeur	Plancton. Cultures marines	Laboratorio del Instituto Español de Oceanografía, Lealtad 11, Santander.
Sanchez, M., Prof.	Biologie. Mollusques	
Rodriguez-Heras, A., Directeur	Chimie appliquée	Laboratorio del Instituto Español de Oceanografía, Felipe Sánchez 20, Vigo.
Lopez Costa, R.	Chimie appliquée. Réfrigération. Congélation	
Cabañas, F., Dr.	Biologie. Mollusques et crustacés	
Alvarino, Angeles, Mme	Zooplancton	
Fernandez-Riego, A., Prof.	Chimie appliquée. Sous-produit	
Ezama, A.	Biologie	
Besada, J. R.	Chimie appliquée à l'industrie	
Rodriguez-Molins, L.	Chimie appliquée	
Montequi, D., Mlle	Chimie analytique. Réfrigération	
Lozano Cabo, F., Directeur		Laboratorio del Instituto Español de Oceanografía, Farola 27, Málaga.
Del Val, M. J., Mme	Chimie analytique	
Fernandez Crehuet, R.	Biologie. Clupéidés	
Oliver-Masuti, M., Directeur	Ichthyologie	Laboratorio del Instituto Español de Oceanografía, Marqués de Cenia 155, Palma de Mallorca.
Balle, P.	Biologie. Phytoplancton	

Name and Title	Special Subjects	Address
Spain (continued).		
Amengual, J., Prof.	Culture de mollusques	Estación Experimental del Instituto Español de Oceanografía, José Clavé 13, Barcelona.
Garcia Cabrera, R.	Biologie marine	Laboratorio del Instituto Español de Oceanografía, Palacio del Mar, Santa Cruz de Tenerife.
Andreu, B., Directeur	Biologie marine	Instituto de Investigaciónes Pesqueras, General Aranda 66, Vigo.
Sweden.		
Hult, J., Dr., Director	Salmon and trout. Crustacea	Kungl. Fiskeristyrelsen, Postfack 2126, Göteborg 2.
Hessle, Chr., Dr., Head of Department	Eel. Herring	
Sahlin, S., Dr.	Eel. Statistics	
Alander, H., Dr.	Hydrography. Herring. Cod	
Otterlind, G.	Cephalopoda. Herring. Cod	
Alm, G., Dr.	Salmon and trout	Sötvattenslaboratoriet, Drottningholm.
Höglund, H., Dr.	Herring. Plankton. Shellfish	Havsfiskelaboratoriet, Lysekil.
Sörensen, S. I. K., Fil. lic.	Whiting. Mackerel	
Jerlov, N., Dr.	Hydrography. Submarine daylight	Kungl. Fiskeristyrelsen, Postfack 1038, Göteborg 4.
Koczy, F., Dr.	Hydrography. Geochemistry. Sediments	
Kullenberg, B., Dr.	Hydrography. Sediments	
Andersson, K. A., Dr.	Herring. Haddock. Fishery	Bragevägen 4, Djursholm 2.
Molander, A. R., Dr.	Flatfish. Sprat. Haddock. Ling	Lysekil.
Rosén, N., Dr.	Statistics. Salmon and trout	Aschebergsgatan 34, Göteborg.

ENGLISH VERSION

Report and Recommendations of the Consultative Committee.

Chairman: Mr. R. S. WIMPENNY.

I. Proceedings.

1. The Chairman opened the meeting by welcoming the members. The Chairman of the Scombriform Fish Committee being absent Dr. RAMALHO was asked to preside over the meetings of this committee. A special welcome was extended to the newly elected President, Prof. SVERDRUP, and to his successor to the chairmanship of the Hydrographical Committee, Dr. BÖHNECKE. The Chairman regretted that the Committee was now seing the end of office for Dr. HODGSON and wished him every happiness in his retirement.

2. Programme of Proceedings.

At the first session the Chairman informed the members that the French delegation had offered to show a most important film from the great depths of the Mediterranean with Prof. PÉRÈS as commentator. It was also announced that there would be a lecture by Prof. FONTAINE on the effect of atomic pollution of the oceans.

After various comments on the programme some slight amendments were agreed.

3. Reports of Committees.

The reports and recommendations of the committees were discussed and passed in the second session, special emphasis being laid upon those involving expenditure.

Attention was drawn to the abolition of two subcommittees, viz., the Sub-Committee on the Faroe Question and the Sub-Committee for the Standardization of Zooplankton Methods. Dr. TÅNING gave a short survey of the work carried out by the Faroe Sub-Committee and informed the members that it had been decided that he should submit a report on this work to be inserted in the *Rapports et Procès-Verbaux*. (Rec. 1).

The recommendation from the Herring Committee next year to hold a special scientific meeting on Herring "Races" was discussed. Dr. HODGSON notified the members that it would have to be a rather lengthy meeting as the question of herring races was a great task and it would be necessary to allow three working days for the discussions. Recommendation 2 was carried.

Professor SVERDRUP explained the amount asked for by the Hydrographical Committee. It had been decided to record surface data on punched cards, and, thanks to a generous offer from the German Hydrographic Institute to do the actual punching, the expenditure would be limited to ca. 9,000 kr. In addition, an amount of 1,000 kr. was stipulated to cover travelling expenses for the Hydrographer in connexion with this work. Recommendations 3a and b were carried.

The General Secretary dealt with the recommendation from the Statistical Committee that 1,500 kr. be allocated for the purchase of punched cards for compiling and filing the new effort statistics from the Council's area. Recommendation 3c was passed.

The recommendation from the Near Northern Committee was passed. (Rec. 8).

4. Publications.

At the second session the Chairman resumed the discussion, deferred from the first session, on the Administrative Reports. It was thought generally that these reports formed a valuable document provided that overlapping could be avoided and replaced by cross-references. It was agreed to continue the Administrative Report in its present form. (Rec. 4a).

In the first session the members had been asked to put the question of the continuance of the Hydrographic Synoptic Charts before their committee. The general opinion was that these charts should be continued, eventually extended, and distributed free of charge to member countries. Recommendation 4b was adopted.

5. Papers submitted to the Council Meeting.

Various suggestions for improvement of meeting techniques were put forward and in view of the great demand this year for copies of papers submitted to committees it was decided that next year there should be furnished at least 150 copies of each paper submitted. A whole set of papers should be available for each member attending the Council meeting, and particular effort should be made to see that delegates and chairmen of committees should have a complete set. It was furthermore agreed that each paper should contain a synopsis of no more than 700 words. Recommendation 5 was passed.

6. F.A.O. Proposition.

Dr. TÅNING reported on Dr. KESTEVEN's paper presented in the Distant Northern Seas Committee and proposed that the Consultative Committee acknowledge this paper in endorsing a recommendation to F.A.O. This was agreed. (Rec. 6).

7. Professor FONTAINE's Lecture.

At the second session a draft in French and English of a recommendation submitted by Prof. M. FONTAINE in continuance of his lecture on "The necessity for protecting the oceans from the dangers of radio-active pollution" was laid on the table. After a minor amendment in the wording of the recom-

mendation it was unanimously accepted. Recommendation 7.

8. Nominations and Elections.

Mr. Finn Devold was elected Chairman of the Herring Committee, replacing Dr. Hodgson; Dr. Ramalho was elected Chairman of the Scombriform Fish Committee, Dr. Böhnecke Chairman of the Hydrographical Committee, and Prof. Steemann Nielsen Chairman of the Plankton Committee. Dr. J. H. Fraser was nominated Editor of the *Fiches d'Identification du Zooplancton* with Dr. G. Thorson as Co-editor.

Mr. R. S. Wimpenny was re-elected Chairman of the Consultative Committee.

II. Recommendations.

1. Organization.

a) It was decided to dissolve the Sub-Committee on the Faroe Question, which was first established in 1938. Recent statistics showed that there was less cause for anxiety about the stocks of haddock and cod than had been felt earlier and that it had not been possible to report any significant relationship between the numbers of recruits to the commercial stocks and the size of the stocks spawning there.

It was furthermore decided that the Chairman prepare a short report to be inserted in the *Rapports et Procès-Verbaux*.

b) It was resolved that the Sub-Committee on the Standardization of Zooplankton Methods be dissolved.

2. Special Scientific Meeting.

It was decided to hold a Special Scientific Meeting on Herring "Races", commencing on Thursday 27. September 1956 before the Council Meeting and allowing for three working days for the proceedings. Convener: Prof. A. Bückmann; Reporter: Mr. B. B. Parrish.

3. Records of Hydrographical and Statistical Data.

a) It was decided that the collection of surface data held by the Service Hydrographique be recorded on punched cards. As a result of the generous offer made by the German Hydrographic Institute in this connexion, the expenses to be borne by the Council would be about 9,000 kr.

b) That a sum of 1,000 kr. be allocated for travelling expenses in connexion with this work during the current year.

c) The Committee approved of the recommendation of the Statistical Committee that 1,500 kr. be allocated to meet the cost of marginal punched cards for filing statistical data relating to effort and yield and facilitating their subsequent examination.

4. Publications.

a) It was agreed that the Administrative Reports be continued as before and that they should be brief, concise, and give, when necessary, cross-references. It was decided that the General Secretary be authorized to edit the material sent to the Council through the chairmen of committees.

b) It was resolved that the provision of Synoptic Charts to members be continued free of charge and that the possibility of extending the area covered by the charts be considered by the Hydrographical Committee.

5. Papers submitted to the Council Meeting.

a) It was agreed that each paper submitted to the various committees of the Council should contain a synopsis of no more than 700 words to be read at the meetings. Papers distributed in advance of the Council Meeting should not be read at the meetings.

b) At least 150 copies of all papers submitted to the Council Meeting should be furnished.

6. Recommendation to F.A.O.

The Committee recommends that all relevant information of the kind indicated in the note submitted by Dr. Kesteven of F.A.O. be given whenever possible, though it is emphasized that our knowledge as to the size of the living aquatic resources, even in the much explored north-east Atlantic is very fragmentary and that a collaboration must unavoidably be of a long-term nature. It was considered that a survey of fisheries resources would be much helped if F.A.O. could implement the recommendation of the Consultative Committee at the 1954 meeting on the desirability of setting up a world fishery bibliographic and abstracting service.

7. Action for the Bureau.

The following recommendation was submitted to the Council, for transmission, through the usual diplomatic channels to the member states as well as to all Atomic Institutions of the United Nations:—

"The I.C.E.S. urge that the deposition in marine waters of waste products from atomic industries should be a matter for international study. The Council strongly recommend that any commission or commissions dealing with the disposal of the atomic waste products should comprise scientists engaged in the study of the physics, chemistry, and biology of the sea, as well as in sub-marine geology".

8. Information on Whiting.

The Committee recommends that the member countries be asked to provide all their statistics on whiting catches (and effort, where possible) taken by all methods of fishery, including industrial fishery, and send this information no later than June 1956, to the Secretariat of the I.C.E.S. for duplication and distribution before the Council Meeting in 1956.

Reports and Programmes of Committees.

Distant Northern Seas Committee.

Chairman: Dr. Å. Vedel Tåning.

I. Proceedings.

The Chairman welcomed members and guests, in particular the two Russian observers present, Dr. Maslov and Dr. Dmitriev. The Chairman reported on the work in the area and on the future programme previously considered in a circular letter.

Some questions from the Consultative Committee were discussed, *inter alia* the Synoptic Charts from the North Sea. As the temperature records given in the present Synoptic Charts are outside the Distant Northern Seas Committee's area the Committee is not concerned; it was however pointed out by several members of the Committee that it would be of great interest if the area covered by the charts could be extended in future to cover also the whole area of the Distant Northern Seas Committee.

Dr. Å. V. Tåning was re-elected Chairman.

II. Communications.

The following reports were submitted to the Committee and discussed at the meeting:—

G. L. Kesteven: "Fishing resources of the I.C.E.S.-area."

A. Kotthaus: "Report on the question of overfishing of the redfish."

J. Magnússon: "Some remarks on the propagation of the redfish (*Sebastes marinus*)".

A. Sigurðsson: "Recent investigations on the plaice in Icelandic waters."

The Committee received the information given by Dr. G. L. Kesteven from F.A.O. of the U.N. with great interest and recommended that all relevant information of the kind indicated should be given whenever possible, though it was emphasized that our knowledge as to the magnitude of the living aquatic resources even in the much explored north-east Atlantic is very fragmentary and to remedy this defect work would have to be organized as a long-term project.

III. Programme of Work.

The Chairman pointed out that programmes of work at sea should be sent to the Chairman to be distributed through the I.C.E.S. General Secretary.

Belgium: During her summer cruises, the fishery protection vessel will probably carry out hydrographical and plankton work in Icelandic waters.

Denmark: The "Dana" will make a cruise in Faroese waters in June and in Greenland waters in July; the "Adolf Jensen" and a small new boat "Tornaq" will carry out work during the whole year in Greenland inshore waters.

England: Programme will be circulated in January.

France: Hydrographic work will be carried out in Iceland and Greenland waters.

Germany: Programme will be given on a later date.

Iceland: Two ships will be available for research work. Research on herring will be made by means of Asdic. Cod and redfish (spawning; samples from commercial catches). Inshore tagging of flatfish especially in Faxa Bay. More detailed programme will be given at the beginning of 1956.

Netherland: No work at sea in 1956 in the area.

Norway: Research work will be carried out in March, April, September, and October in the Barents Sea on cod, haddock, and redfish together with hydrographic work.

Scotland: A new ship will be available for research work in 1956. No detailed programme can be given at the moment but some work will probably be carried out in Faroese waters.

IV. The Sub-Committee on the Faroe Question.

Members and suppleants present were:—

Denmark:	Dr. Å. Vedel Tåning
	Dr. E. Bertelsen
	Mr. J. S. Joensen
France:	M. Cl. Nédélec
Germany:	Dr. A. Kotthaus
	Dr. U. Schmidt
Iceland:	Dr. Árni Fridriksson
Norway:	Mr. G. Rollefsen
United Kingdom:	Mr. R. S. Wimpenny
	Dr. C. E. Lucas

The Chairman opened the meeting at which representatives of Denmark, France, Germany, Iceland, Norway, and the United Kingdom were present.

Referring to the recommendations of 1948, which represented the working programme of the Sub-Committee the Chairman drew attention to the fact that it might be possible this year to make recommendations to the Distant Northern Seas Committee regarding the problems laid before it.

Reports on the present position in the Faroe region, including assessment of eggs, larvae, and fishable stocks, were presented from Denmark and the United Kingdom. After discussing these in relation to earlier reports, the Sub-Committee came to the following conclusions:—

1. The recent statistics gave less cause for anxiety about the stocks of haddock and cod than had been felt earlier.

2. It was not possible to report any significant relationship between the numbers of recruits to the commercial stocks and the size of the stocks spawning there.

Bearing in mind (a) the introduction in 1954 of a minimum mesh regulation (75 mm.) by the Permanent Commission and (b) the recent agreement between Denmark and the United Kingdom on Fishery Limits at Faroe, the Sub-Committee felt that it would be necessary for a few years to elapse before the results of these conservation measures could be assessed.

In the hope that circumstances would remain stable long enough for such an assessment to be made, and in the assurance that the countries concerned would maintain their investigations into the Faroe stocks, the Sub-Committee recommended:—

1) That it was no longer necessary for the Sub-Committee to meet, although it was hoped that the Distant Northern Seas Committee would pay special attention to the state of the stocks of Faroe, both in relation to the recent conservation measures and in relation to environmental changes.

2) That the Chairman prepare and publish a short report.

Near Northern Seas Committee.

Chairman: Dr. J. Hult.

I. Proceedings.

The Chairman opened the meeting by welcoming the members and visitors. He pointed out the difficulties which had arisen through the rearrangement of committees agreed upon in 1954, especially regarding the material for the Administrative Report and the *Annales Biologiques* and he expressed the hope that these difficulties should be of a temporary character only.

The list of members was checked and no alterations were made.

The Administrative Report and the *Annales Biologiques* were adopted.

At the request of the Chairman of the Consultative Committee the question of the continuation of the Hydrographic Synoptic Charts was discussed. Members from six countries were in favour of a continued publication of the charts. Some of those members were even prepared to pay for the charts, although as a principle they were very much against such a procedure.

Dr. J. Hult was re-elected Chairman.

II. Communications.

The following papers were presented and discussed by the Committee:—

A. Bückmann, G. Hempel, and J. Messtorff: "On the abundance and distribution of fish fry in the southern North Sea during March, 1955".

R. J. H. Beverton: "A note on mortality and mesh regulation of North Sea sole".

J. Lundbeck: "Preliminary results on long-period changes in the stocks of some North Sea commercial fish species".

S. I. K. Sörensen: "Progress report on the Swedish investigations on whiting in the Skagerak and the Kattegat".

Marine Laboratory, Aberdeen: "Effect of the Danish 'industrial' fishery on the North Sea commercial whiting fishery. Second review, 1955".

J. A. Gulland: "The effect of the Danish industrial fishery on the North Sea catch of whiting for consumption (i. e., above 20 cm.)."

III. Programme of Work.

The Committee's long-term programme was discussed and it was agreed that, owing to the new area division, it was necessary to draw up a new long-term programme including parts of the previous long-term programmes for the former North Sea and Transition areas. This programme should, if possible, be presented at the meeting in 1956.

Copies of the provisional 1956 programme were available from some member countries and the representatives for the rest of the countries promised, as soon as possible, to send in copies of their programmes to the Chairman, for distribution to the members of the Committee.

IV. Recommendation.

The Near Northern Seas Committee recommends that the member countries be asked to provide all their statistics on whiting catches (and effort, where possible) taken by all methods of fishery, including industrial fishery, and send this information no later than June 1956, to the Secretariat of the I.C.E.S. for duplication and distribution before the Council Meeting in 1956.

Baltic-Belt Seas Committee.

Chairman: Dr. Aa. J. C. Jensen.

I. Proceedings.

The Chairman welcomed members and guests, especially the observers Dr. Cieglewicz and Dr. Mańkowski from Poland and Mrs. Dementjeva and Prof. Svetovidov from U.S.S.R.

The current investigations were discussed. At request the Polish and Russian observers reported on the extent of the recent research work in the Baltic from their countries and on some of the results obtained.

Standard gears for research purposes were discussed in a sub-committee. It was agreed to recommend the use of the same standard gears in the various countries working in the Committee's area. Proposals as to detail should be send by the Chairman to the members of the Committee through the I.C.E.S. as soon as possible.

Advance copies of the Administrative Report and of the *Annales Biologiques* were submitted to the contributors for corrections and amendments.

The continued publication of the Synoptic Charts were discussed. They were considered of no direct value for the Baltic-Belt Seas Committee, but it was recommended that they be continued on the best possible economic basis.

The papers mentioned below were read and discussed. It was agreed that the consequences of transplantation of Pacific salmon to the Baltic should be studied as closely as possible.

Dr. Jensen was re-elected Chairman.

II. Communications.

The following papers were read and discussed:—

S. Sahlin: "Tagging of eel at the south coast of Scania".

F.A.O. Biology Branch, Fisheries Division: "Possibilities of transplanting species of Pacific salmon into the Baltic".

G. Alm: "Swedish salmon fisheries in the Baltic precincts in the last years".

Aa. J. C. Jensen: "Productivity of the various regions of the sea with special reference to the Baltic-Belts".

K. Banse: "On the behaviour and distribution of Polychaetes and echinoderm larvae in the Kiel Bay."

At request Mrs. T. Dementjeva read a paper on the U.S.S.R.'s researches on the stock of Baltic herring and cod, and Dr. Cieglewicz a paper by M. Mulicki: "The cod migrations in the southern Baltic".

III. Programme of Work.

It was agreed to continue the previous year's programme for the coming year. Stress was laid upon the necessity to determine phosphate and possibly also nitrate. The influence of hydrographical factors upon fluctuations in the fish stocks should also be closely studied.

The Committee recommended that the tagging of cod and herring should be continued and extended.

Atlantic Committee.

Chairman: Dr. J. Furnestin.

I. Proceedings.

The list of members was checked, the Administrative Report adopted, *Annales Biologiques* corrected, and the communications announced.

Dr. J. Furnestin was re-elected Chairman.

II. Communications.

R. Letaconnoux: "Hydrological conditions on the fishing grounds off Cape Finisterre."

R. Moal: "Note on the surface temperature observations in the bay of Repos (Mauritania) in 1953—54."

Vincent-Cuaz: "Special hydrographic features of the year 1954 according to a Mauritanian station."

G. Kurc & G. de la Tourrasse: "Detection of tunny (*Thunnus thynnus*) by means of echo-sounding."

R. Coupé: "Note on the sex of *Pagellus acarne* Risso from the Moroccan coasts."

R. Moal: "Observations of *Sciaena aquila* Lacèp. in the region of Port-Etienne."

C. Maurin: "The fishery of hake in Morocco."

W. Geiger: "The brain of *Merluccius merluccius* (L.) and *Merluccius senegalensis* Cadenat. Contribution to the comparative study of the two species."

A. Ramalho: "Statistics of trawl fishery in Portugal and in Mauritania."

III. Various Considerations.

It had been noted that the complete separation of the Sardine, the Scombriform, and the Atlantic Committees had impeded the work of the Atlantic Committee. The members present agreed with the chairmen of the three committees that questions concerning the clupeid and scombriform fish should be treated in the Atlantic Committee as long as they did not relate to the morphology and biology, *stricto sensu*, of the species.

IV. Programme of Work.

It was decided to study, in 1956, the Sparidae and Scienidae, especially *Pagellus centrodontus*, *Dentex marocanus*, and *Sciaena aquila*, species important for the trawl fishery.

Comparative Fishing Committee.

Chairman: Dr. C. E. Lucas.

I. Proceedings.

The Chairman took the opportunity to welcome the members, observers, and all others who were present. Representatives of Denmark, England, Finland, France, Germany, Iceland, Netherlands, Norway, Scotland, and Sweden attended, and reported that there would be no changes in their countries' representations.

The Chairman thanked members for their assistance in producing the Administrative Report which was available on the table as a proof print. It was accepted as a satisfactory record and the Committee further agreed that no space would be needed for reporting on research work in the *Annales Biologiques*.

Although provisional research programmes for only a few countries were available, others were promised for the near future and arrangements were made for these to be circulated as soon as possible so as to provide facilities for co-ordination and exchange of views.

The Committee were most fortunate in that Dr. Kristjónsson of F.A.O. was present and was able to give some provisional information about a world meeting which was under consideration by F.A.O. No definite decisions have yet been taken, but subjects being considered include (a) fishing gear investigations, (b) characteristics of natural and synthetic fibres and detection of fish shoals, all within the essential background of fishery biology. Among the objectives would be the spreading of information about new developments and research, and the stimulation of interest in the important possibilities which lay before both underdeveloped and more developed countries, in securing the maximum fishing efficiency.

Before introducing the scientific contributions the Chairman reminded the meeting of (a) the responsibility imposed on them by the Consultative Committee, to provide and assess estimates of "fishing effort" and (b) the request from the Liaison Committee for up-to-date information concerning "light" trawls, their definition, testing and selectivity.

It was most helpful for the valuable discussions which followed that it had been possible to circulate

nearly all of the papers before the meeting. A list of those circulated is set out below. In addition Dr. JENSEN reported on his experiments and observations in relation to mesh measurement and at very short notice Dr. CARRUTHERS kindly gave the Committee an account of the simple apparatus he had designed for measuring the inclination and deviation of trawl warps, headlines, etc. (published recently).

II. Contributions.

1. Fishing Effort.

J. A. GULLAND: "On the measurement of demersal fishing effort", No. 32.

J. A. POPE: "Fishing power and fishing effort of vessels landing at Aberdeen", No. 35.

2. Mesh Selection.

J. FURNESTIN: "Expériences sur les maillages des chaluts", No. 67.

A. R. MARGETTS: "Interim report on the selection by trawl cod-end meshes made on various materials", No. 43.

A. R. MARGETTS: "Definition and test of light trawl", No. 65.

3. Mesh Measurement.

A. v. BRANDT: "Measurements of meshes of trawl nets", No. 40.

B. B. PARRISH, R. JONES, and J. A. POPE: "A comparison of mesh measuring methods", No. 34.

R. J. H. BEVERTON: "Measurement of net meshes", No. 64.

4. Dynamics and Behaviour of Nets.

J. H. STEELE: "Review of theoretical studies on a trawl", No. 15.

J. SCHÄRFE: "New German investigations on trawling gear", No. 41.

5. Fish Behaviour.

J. SCHÄRFE: "Echo-sounder records on the behaviour of fishes towards warps", No. 42.

1. Following the interesting discussion on Fishing Effort, it was decided to ask the Consultative Committee to draw the attention of the Statistical Committee to the two papers which had been contributed. It was evident that information of value was being collected in several countries and the Chairman hoped that sufficient contributions would be available in 1956 to provide some preliminary but valuable comparisons between the efficiencies of the gears used in a number of fisheries.

2. There was a most useful exchange of views after the three papers had been read on Mesh Selection, and a particularly keen and valuable one on the subject of "light" trawls. During the course of the latter it became evident that much more precision would be needed in the definition of materials and processes, and that much more research was urgently needed before any precise definition could be laid down.

3. Keen and critical consideration was also given to the four contributions together with Mr. BOEREMA's paper of 1954 on Mesh Measurements, and members were informed that I.C.N.A.F. would be discussing similar matters early in 1956. Whilst opinions were at present divergent on important details, there was a useful measure of agreement among members of this committee.

4. The three contributions on the Dynamics and Behaviour of Nets showed (a) that valuable data are now being obtained concerning commercial nets in action, and (b) that these might usefully be supplemented by theoretical and experimental consideration of the hydrodynamics of model and full-scale nets.

5. The last, but by no means least, contribution described an ingenious and effective experiment for observing the reactions of fish to the trawl by echo-sounders employed on a research vessel and a following rubber dinghy.

In conclusion the Chairman thanked all the contributors, present and absent, and those who had taken part in the discussions, for their assistance in providing a most stimulating meeting.

Dr. C. E. LUCAS was re-elected Chairman.

III. Recommendations.

It was recommended that:—

1. There is still insufficient evidence for a comprehensive definition, but such evidence as is now available suggests that "light" trawls may provisionally be defined as trawls which are made throughout of cotton or hemp (*Cannabis sativa*).

In the absence of selectivity data it is not possible at present to include in the definitions nets made wholly or in part of nylon, perlon and other synthetic fibres; and it is realized that account may have to be taken of other factors such as power, and particularly of double and single braiding, but also including fishing twine size and dressing. Experiments should be made as soon as possible to supply these unknown data.

2. The attention of the Permanent Commission be drawn to the facts that, in mesh measurement, greater consistency will be achieved by gauges developing a direct and constant longitudinal pressure of about 3 kg. Such gauges would be adequate for measuring manila, sisal, and hemp cod-ends. Some gauges of this type have already been developed.

Gadoid Fish Committee.

Chairman: Mr. G. Rollefsen.

I. Proceedings.

The following countries were represented: Denmark, England, Germany, Iceland, Norway, Spain, and Scotland. In the membership there was only one alteration; instead of Dr. Lundbeck, Germany would be represented by Dr. U. Schmidt.

The Soviet Union was represented by two observers, Messrs. Maslov and Svetovidov.

The Chairman outlined the duties of the Gadoid Committee and mentioned questions which needed immediate attention. Certain other questions of great importance could be foreseen and the Committee ought to try to identify the problems which were likely to arise in near future.

The value of the Synoptic Charts appears to be rather limited and it is thought worthwhile considering whether they could be produced more cheaply.

The Gadoid Committee finds that it would be valuable at its next meeting to receive contributions on the hake biology and the present stage of the hake fisheries, with special reference to commercial statistics of catch and effort.

Mr. Rollefsen was re-elected Chairman.

II. Communications.

The following contributions were submitted:—

P. M. Hansen: "The stock of cod in Greenland waters, 1955." (Preliminary report).

Jón Jónsson: "Relationship between temperature and growth of Icelandic cod."

U. Schmidt: "Contribution to the biology of the coalfish in Norwegian waters."

G. Sætersdal: "Preliminary report on cod marking experiments in the Barents Sea."

N. A. Maslov: "Age and size distribution of cod and haddock in pre- and post-war years."

Steinar Olsen: "Norwegian activities in coalfish investigations, 1954—55."

Herring Committee.

Chairman: Dr. W. C. Hodgson.

I. Proceedings.

The list of members was checked and certain amendments made. The Administrative Report and the *Annales Biologiques* were presented and adopted.

The Chairman reported on the results of the appeal to members to supply echo-sounding data on herrings, as outlined in Recommendation 2, 1954. Only one set of data had been received during the year, and members were again asked to collect material for transmission to the Chairman.

Reports of the work done by each country during the year were given, and finally the Chairman thanked the members of the Editorial Committee who helped to prepare the text of the Report on Echo-Sounding and also the General Secretary and his staff for completing the publication of the work.

The Committee recommended the continuance of the Synoptic Charts but without payment, if possible.

Dr. W. C. Hodgson announced his retirement from the Chairmanship of the Committee and Mr. Finn Devold was elected in his stead.

II. Communications.

The following papers were read and discussed during the meeting:—

O. Dragesund: "Herring tagging experiments in Norway, 1954—55."

J. Ancellin: "Hareng du sud de la Mer du Nord et de la Manche Orientale." (Read by C. Nédélec).

Ch. Gilis: "Evolution de la pêche belge aux harengs dans la Mer du Nord au cours des années 1950 à 1955."

Á. Friðriksson: "The north coast herrings of Iceland in 1955."

F. Devold: "Scandinavian herring periods."

III. Recommendation.

It is recommended that a special scientific meeting on Herring "Racial" Studies should be held during the 1956 meeting.

Sardine Committee.

Chairman: Dr. J. Cuesta.

I. Proceedings.

Professor A. Bückmann was included in the list of members of the Committee.

The Administrative Report was adopted, and there were no comments on the *Annales Biologiques*.

The members gave information on the work carried out in their own country. As to work to be carried out in the coming year the Committee agreed to concentrate their efforts on actual problems. In view of this the Chairman was charged with preparing a programme without delay.

Dr. Ramalho suggested to circulate, between specialists, certain samples, for instance, scales, etc.

In consideration of the continuance of the Synoptic Charts the members agreed that they were of no great value to the Committee in view of the most important sardine grounds not being included in the area covered by the charts.

Dr. Cuesta was re-elected Chairman.

II. Communications.

The following communications were presented and discussed:—

R. C. Garcia Cabrera & F. Navarro: "Preliminary observations on the sardine of Tenerife (Canary Islands)."

M. Rossignol: "Biology of *Sardinella* from the region of Pointe-Noire. Summary of our knowledge."

J. Cuesta: "The presence of *Scolex polymorphus* in the anchovy (*Engraulis encrasicholus*)."

Scombriform Fish Committee.

In the Chair: Dr. A. M. Ramalho.

I. Proceedings.

Prof. Frade being absent Dr. Ramalho replaced him, with the consent of the Committee, until the election of chairman for the ensuing year. The list of members was checked; the Administrative Report and the *Annales Biologiques* were presented and adopted.

A scheme for a general programme of work, which had been prepared and distributed in February 1955 by Prof. Frade, was presented and discussed together with the proposals sent out in April by Mr. A. C. Simpson.

II. Communications and Films.

A. Communications.

Germo alalunga.

A. Figuéras: "Observations on the age and growth of the tunny (*Germo alalunga* Gmelin)."

J. M. Navaz: "The *Thunnus thynnus* and the *Germo alalunga* at the Biscayan coast (1954)."

Thunnus thynnus.

K. Tiews: "Über die Anzahl der Kiemenreusenfortsätze bei Roten Thunfischen (*Thunnus thynnus* L.) die im September 1955 in der Nordsee gefangen wurden."

J. Furnestin and collaborators: "Growth in length and weight of young tunny in Morocco."

Fishery.

P. F. Meyer-Waarden: "Deutsche Thunfischuntersuchungen."

F. Ruesgas-Cabañas: "A new method of fishing in the northwest of Spain."

B. Films.

1. "A tuna-clipper in African waters." (Institut Scientifique du Maroc).
2. "Long-line fishing for tuna in the Gulf of Mexico." (Fish and Wildlife Service, U.S.A.).

III. Programme of Work.

Although the Committee acknowledged the necessity of a general programme of work the members thought it more adequate to limit the studies for 1956 to a special subject. It was consequently decided to consider, without the exclusion of other questions, the following points: (a) Tagging, for the study of migrations, of young tunny on the Moroccan coast and in the Bay of Biscay, and adult tunny in the North Sea. (b) Observations on the development of the sexual glands. (c) Measurements of fish for the study of the growth of the exploited stocks.

Salmon and Trout Committee.

Chairman: Dr. A. E. J. Went.

I. Proceedings.

The Chairman welcomed the members and guests and the list of members was checked. The paper presented by F.A.O. on "Possibilities of transplanting species of Pacific salmon into the Baltic Sea" was discussed and it was agreed that as the Swedish authorities were engaged on an extensive programme of artificial rearing and stocking of the Atlantic salmon to compensate for the loss of natural spawning facilities caused by hydro-electric development of Swedish rivers it would be premature to undertake such transplantations, even at a small scale. Members furthermore stressed the inadequacy of our knowledge of many of the factors which governed the development of the stocks of Atlantic salmon, both in the Baltic and in western Europe generally.

The Committee also discussed briefly the appearance of certain diseases in hatchery reared rainbow trout in certain countries in Europe and it was agreed that time should be provided at future meetings for an exchange of news on the question of diseases in salmon and trout with particular reference to fish reared artificially.

It was stated by the Swedish representatives that the Swedish Migratory Fish Committee had engaged the services of two scientists who were now working on the physiology of "smoltification" in salmon. The Committee invited the Swedish representatives to submit at the next meeting a progress report on this work, preferably a verbal report from one of the scientists concerned.

Dr. A. E. J. Went was re-elected Chairman.

II. Communications.

F.A.O. Biology Branch, Fisheries Division: "Possibilities of transplanting species of Pacific salmon into the Baltic Sea."

B. Carlin: "Tagging of salmon smolts in the River Lagan."

R. Vibert: "Laboratory methods for studying and increasing survival in the wild of hatchery reared trout and salmon fry."

III. Proposed Excursion for 1956.

The Chairman reported that the Swedish representatives had suggested that it would be possible to arrange a short excursion (lasting one day only) from Copenhagen to the River Lagan, Sweden, on the occasion of the next meeting of the Council. The Committee accepted with grateful thanks this offer and it was left to the Chairman and Dr. Carlin to work out suitable details for the excursion.

IV. Programme of Work.

The Committee decided to continue work on the tagging of clean salmon in the sea, smolts, and kelts in accordance with the programme laid down in previous years. The necessity for experiments on the relative efficiency of different types of tags for smolts was stressed and it was agreed that in as many localities as possible such work would be carried out. Members agreed to exchange tags for this purpose as far as possible.

V. Recommendation.

The Committee recommends that the present Administrative Report relating to the activities of each country is a valuable document being the only source of information of the progress of work on salmon and trout in Europe today. It is therefore strongly recommended that the Administrative Report be printed in future in the same form as heretofore.

Shellfish Committee.

Chairman: Dr. B. Havinga.

I. Proceedings.

The Chairman opened the meeting and welcomed the members, especially the Swedish members who were represented for the first time.

The list of members was unchanged, except that M. P. Ladouce was replaced by M. P. Trochon.

The Administrative Report and the *Annales Biologiques* were adopted with only a minor correction.

The programme for 1956 was discussed, and the Chairman emphasized that programmes should be submitted in order to enable him to distribute them to members in various countries.

It appeared that the Synoptic Charts were not used to any appreciable extent by the members of the Shellfish Committee.

Dr. Havinga was re-elected Chairman.

II. Sanitary Control.

During the meeting in 1954 it was decided that the existing methods of sanitary control of shellfish should be studied and compared in the various countries interested in this subject. This has been done in England and the Netherlands, with the result that papers were received, one by Dr. N. Reynolds & P. C. Wood and one by Dr. Grijns. In addition, M. P. Trochon mentioned a new method developed at the Institut Pasteur, Paris. It was decided that a comparative study should be devoted to these papers and that the results should be reported in the next meeting.

III. Communications.

B. Andreu & P. Arté: "Expériences sur le contrôle et fixation des larves d'huître plate (*O. edulis*) et sur le détroquage et la croissance des jeunes huîtres dans la Ría de Vigo (NO. d'Espagne)."

L. Marteil: "Répartition actuelle de *Mytilicola intestinalis* St. sur la côte sud de Bretagne."

P. Trochon: "Prévision de la date probable de la première émission de larves d'huîtres dans la région de la Seudre."

A. Figuéras: "Les pigments des plages comme indice de leur production."

P. C. Wood: "Factors affecting the pollution and self-purification of molluscan shellfish in a polluted estuary."

H. A. Cole: "Preliminary study of growth rate in cockles in relation to commercial exploitation."

J. A. Pope: "Body form and weight-length relationships in the lobster (*Homarus vulgaris* Edw.)."

A series of about 50 photographs taken by Dr. Cole, Dr. Millar, and Dr. Vilela during the tour of the centres of oyster and mussel culture in France in 1954, were shown.

Hydrographical Committee.

Chairman: Prof. H. U. Sverdrup.

I. Proceedings.

The list of members was checked. For Finland Dr. I. Hela had replaced Dr. Granqvist. Admiral Termijtelen (Netherlands) had retired from the Committee. At the present meeting Scotland would be represented by Mr. R. Johnston. For U.S.S.R. Dr. Lednev attended as an observer.

The Committee's Administrative Report for 1954 was approved. In connexion herewith the Chairman informed the members that a reduction of the number of committee reports had been considered in the Consultative Committee. He was of the opinion, however, that the reports of the functional committees should be retained as they contained records which it might be useful to consult at a later date.

The Hydrographer's report on work carried out by the Service Hydrographique of the Council since the last meeting was presented.

In this connexion the Chairman informed the Committee that the Chairman of the Consultative Committee had asked the chairmen of the various committees to procure more specific statements on the value of the Synoptic Hydrographic Charts than had been available hitherto.

The Committee decided to send the following statement to the Consultative Committee:—

"The Hydrographical Committee realizes that the prime purpose of the Synoptic Charts is to supply marine biologists with information for them to use in their studies. In this connexion the Hydrographical Committee wishes to point out that a long series of such charts can be expected to be of particular value in the future when various relationships between hydrography and marine biology suggest themselves for examination. The effort made now to produce the charts will in all probability obviate costly expenditure of labour when such situations arise. Therefore a stand upon the merits of the charts should not be taken too precipitately.

The Hydrographical Committee also wishes to express the opinion that a long series of the Synoptic Charts will provide a unique material for the examination of questions pertaining to the interrelation between the atmosphere and the sea. Thus they will have a value to branches of science beyond the scope of activity of the I.C.E.S."

In connexion with the report on the activity of the Service Hydrographique the Committee, on the proposal of Lt.-Cdr. Lumby, expressed its great satisfaction with the amount and the quality of the work that had been completed in the past year.

Lt.-Cdr. Lumby reported on the work of the Sub-Committee for the Preparation of Final Mean Charts of Surface Salinity and Temperature.

Rec. 1 was carried. The Committee wished to express its gratitude to the German Hydrographic Institute for the generous offer made with regard to transferring the data to punched cards.

The Sub-Committee, consisting of Messrs. Lumby (Chairman), Dietrich and Groen agreed to act as an Advisory Sub-Committee for the work, in case Rec. 1 was adopted by the Council.

Mr. HERMANN reported on the work of the Sub-Committee for Consideration of a Revision of the Standard Method for Salinity Determination.

Rec. 2 was carried. Furthermore the Committee recommended that steps be taken to get the loan of a Wenner-bridge for salinity determinations in order to gain experience with the method at one of the institutions that take part in the work of the Council.

Dr. BÖHNECKE and Lt.-Cdr. LUMBY reported on the work of the Sub-Committee on the International Geophysical Year 1957—58 (I.G.Y.). During the Council Meeting the Sub-Committee had contacted representatives for the countries likely to take part in the work to be carried out under the auspices of the Council in order to complete and co-ordinate the plans. The general outlook was very promising. It was highly appreciated that the U.S.S.R. would contribute very much to the undertaking.

Dr. HELA tabled a proposal for investigations on the water exchange between the Baltic and the adjacent seas to be carried out in connexion with the I.G.Y.

Dr. LEDNEV gave a general review of the Russian plans. The detailed plans would be available for I.C.E.S., probably in December 1955.

Rec. 3 was carried. At the proposal of the Chairman U.S.S.R. and Denmark were asked to nominate members to the Sub-Committee.

The Hydrographer's report on inclusion of BT-observations in the *Bulletin Hydrographique* was tabled.

Commodore COLLINS suggested that records of positions and dates of BT-observations should be given in the *Bulletin Hydrographique*.

The following resolution was carried:—

"The Hydrographical Committee recommends that in connexion with submitting usual data for publication in the *Bulletin Hydrographique* positions and dates of BT records which supplement the temperature data obtained by thermometer be submitted to the Service Hydrographique for publication."

After some discussion on the various methods by which the results of BT-observations might be distributed it was, at the proposal of the Chairman, decided to set up a Sub-Committee to further consider the matter. Dr. GROEN (to act as Chairman) and Dr. KULLENBERG were appointed members of the Sub-Committee to which also Iceland and U.S.S.R. were asked to nominate members.

Provisional programmes for hydrographic work in the various countries were tabled.

The Hydrographer presented a survey of routine observations carried out along fixed lines or at fixed stations by research and commercial vessels, lightships, etc. A revised list of standard observation depths was distributed.

As Professor SVERDRUP had to retire as Chairman of the Committee an *ad hoc* Sub-Committee, consisting of Messrs. DESBROSSES, LUMBY, and THOMSEN, was appointed for the purpose of nominating a new Chairman. At the proposal of this Sub-Committee Dr. BÖHNECKE was elected Chairman.

Dr. BÖHNECKE expressed the Committee's deep gratitude to Professor SVERDRUP for his most successful work in the Hydrographical Committee and for his efforts to increase the usefulness of hydrography to the other branches of the Council.

In thanking, Professor SVERDRUP stressed that besides furthering the work of the Hydrographical Committee he had tried to promote the hydrographic activity in the other committees. As the Hydrographical Committee was dealing with the environment of the organisms studied by the other committees of the Council its work was basic to these committees.

II. Communications.

With Dr. BÖHNECKE in the Chair the following lectures were given:—

M. ROESSINGH: "Sex ratio in copepods as an indicator of the waterflow along the Dutch coast." (Presented by Mr. BOEREMA).

J. N. CARRUTHERS: "Some further current-measuring procedures of fisheries interest." Dr. BÖHNECKE and Dr. DIETRICH took part in the discussion.

G. DIETRICH: "Some features from the circulation in the Irminger Sea in June 1955." Messrs. BÖHNECKE, HERMANN, DIETZ, GROEN, LUMBY, CARRUTHERS, and COLLINS took part in the discussion.

G. DIETRICH: "Some hydrographic results of a multiple ship survey in the southern North Sea in March 1955." Messrs. BÖHNECKE, LUMBY, and CARRUTHERS took part in the discussion.

G. BERRIT: "Comparaison des conditions hydrologiques à Pointe-Noire et à Dakar." (Presented by M. DESBROSSES).

J. E. FJELDSTAD: "Eddy viscosity, current and wind." Messrs. KULLENBERG, CARRUTHERS, and SVERDRUP took part in the discussion.

III. Recommendations.

1. The Hydrographical Committee recommends that:—

   (a) The collection of surface data held by the Service Hydrographique be recorded on punched cards.

   As a result of the generous offer made by the German Hydrographic Institute in this connexion, the expenses to be borne by the Council would be about kr. 9,000.

   (b) The preparation of the mean charts be undertaken according to the principles and methods suggested by the Sub-Committee set up to consider the question. Since, as a further result of the offer made by the German Hydrographic Institute, the task may be undertaken by the Service Hydrographique as part of their normal work, it appears that no additional expense would be incurred by the Council.

(c) A sum of kr. 1,000 be allocated for travelling expenses in connexion with the work during the current year.
(d) An Atlas of charts and tables be published, the cost being, very approximately, kr. 3,500 for 500 copies of the Atlas + kr. 6,700 for the same number of copies of the tables.
(e) An Advisory Sub-Committee be set up to assist in the conduct of the work.

2. The Hydrographical Committee after considering the report of its Sub-Committee recommends that:—
(a) A new description of the Mohr-Knudsen procedure should be worked out as a standard method for the routine determination of salinity. The description should include the modifications that are in general use and have been shown not to reduce the accuracy of the method, namely, the use of magnetic stirring and fluorescein indicator. The description should also include a specification of the burette and pipette to be used.
(b) The Sub-Committee which was appointed in 1954 to consider the revision of the method should continue and draw up the standard method for final publication.

3. International Geophysical Year (I.G.Y.):—
(a) The Hydrographical Committee recommends that the International Council for the Exploration of the Sea (I.C.E.S.) should participate in the plans of the quasi-synoptical survey in the northern North Atlantic during the I.G.Y., special consideration being given to the Polar Front region.
(b) Referring to the report of its Sub-Committee for the I.G.Y. and to discussions with representatives for the participating countries the Hydrographical Committee recommends that the investigations should be carried out at least 2 times during the I.G.Y., namely in the months of March 1958 and September 1958, both ± 1 month.
(c) Considering the gaps that the plans under discussion still contain and the readiness of some participating countries to fill in these gaps the Hydrographical Committee recommends that the activity of the Sub-Committee be continued for completing and co-ordinating these plans.
(d) The Hydrographical Committee recommends that the I.C.E.S. should approach the International Commission for the Northwest Atlantic Fisheries (I.C.N.A.F.) who have expressed their readiness to co-operate, asking for nomination of representatives to this Sub-Committee, in order to co-ordinate the plans of the two bodies.
(e) Having in mind the high value of the investigations proposed by the Institute of Marine Research, Helsinki, in the water exchange between the Baltic and the adjacent seas, the Hydrographical Committee recommends this work to be carried out, but feels that it should be done under the auspices of the Association Internationale d'Océanographie Physique (Comité Spécial pour l'Année Géophysique Internationale).

Errata.

Rapp. et Proc.-Verb., **124**, Pt. I, p. 44:
Recommendation 3 (e): The depths 150 and 3,000 metres should be included in the series of standard depths.
Rapp. et Proc.-Verb., **138**, Pt. I, p. 35:
Recommendation 3 (d): The depth 50 metres should be included in the series of standard depths.

Plankton Committee.

Chairman: Prof. T. Braarud.

I. Proceedings.

The reports on work done in 1954 were adopted. The progress of the publication of the Plankton Identification Sheets was discussed in connexion with a report from Dr. G. Thorson, and the members of the committee were asked to assist the editor of the sheets in finding authors for new sheets. The Committee proposed that Dr. J. H. Fraser be nominated Editor for the Plankton Identification Sheets with Dr. Thorson as Co-editor.

In reply to a question from the Consultative Committee the Committee unanimously stated that the Synoptic Charts were considered to be very useful and that they would also be of value in future plankton studies in the area covered by the charts. If possible, the charts should be supplied free of charge.

The Sub-Committee for Standardization of Zooplankton Methods was dissolved.

Prof. E. Steemann Nielsen was elected Chairman for the next year.

II. Communications.

C. Rees: "The distribution of *Calanus* in relation to currents and other hydrographic conditions off the Norwegian coast."
V. Hansen: "Zooplankton and hydrography in the southern part of the Norwegian Sea."

M. Roessingh & J. F. de Veen: Observations on the patchiness of plaice eggs." (Read by Mr. Boerema).
C. Rees: "The relative distribution of *Calanus finmarchicus* and *C. helgolandicus* in the North Sea, Norwegian Sea and Atlantic."
J. Krey: "Comparative studies of the standing crop of plankton biomass in coastal waters."
E. Steemann Nielsen: "Investigations on the production of organic matter in Danish and Greenlandic waters."
P. T. Marshall: "Phytoplankton production in the western Barents Sea 1949 to 1954."
S. le Roux: "Observations sur les phytoplanctons du Bassin d'Arcachon dans des conditions de brusques variations hydrologiques." (Read by P. Desbrosses).
M. Rossignol: "Sur la présence d'Ebriédiens dans le plancton de la baie de Pointe-Noire (A.E.F.)." (Read by P. Desbrosses).
Vincent Cuaz: "Premières observations de plancton brun sur les côtes de Mauritanie, ses conditions d'apparition." (Read by P. Desbrosses).
G. Berge: "Green water and mass production of *Coccolithus Huxleyi* along the west coast of Norway during May—June 1955."

The effect of the Atlantic inflow upon hydrography and plankton in the North Sea and the Norwegian Sea in 1955 was discussed.

Statistical Committee.

Chairman: Dr. J. Lundbeck.

I. Proceedings.

The *Bulletin Statistique* for 1953, which was the first volume to be edited by Dr. Fridriksson, was laid before the Committee. The Committee took notice of the General Secretary's information that effort statistics for 1954 had been received from six member countries. Similar figures may be expected from other countries for the coming years. A publication from Portugal, containing effort statistics for 1935—1954, was distributed. It was agreed that the new material concerning fishing effort and corresponding catches should be published in a table to replace the former Table 7 of the *Bulletin Statistique*; this table should contain effort terms and fish species as headings, and be arranged by types of gear for each statistical area. In order to reduce costs, the list of fish names and the maps should be omitted.

The Committee also discussed a proposal from the General Secretary, that a card index of data on effort and yield statistics be established, beginning with the year 1954 or an earlier year as far back as data are available. Each card would be specified as to country, fishing region, gear, effort, and catch of each species of fish, thus requiring about 1,500 cards a year. By the use of marginally punched cards, all kinds of statistical information could be easily accessible. Dr. Kesteven (F.A.O.) offered kindly to compile the 1954 material after the principle applied by F.A.O., without cost to I.C.E.S. This was accepted with appreciation.

Referring to discussions at the meeting of 1954, it was agreed that, at the next annual meeting, any contributions relating especially to the use of the effort statistics should be dealt with at the ordinary meeting of the Committee.

Full appreciation was given to the General Secretary for promptly providing the latest statistical information to the Permanent Commission of the International Fisheries Convention of 1946.

The Statistical Committee fully supports the recommendation of the Near Northern Seas Committee which reads as follows:—

"The Near Northern Seas Committee recommends that the member countries be asked to provide all their statistics on whiting catches (and effort, where possible) taken by all methods of fishery, including industrial fishery, and send this information not later than June 1956, to the Secretariat of the I.C.E.S. for duplication and distribution before the Council Meeting in 1956."

Dr. J. Lundbeck was re-elected Chairman.

II. Recommendation.

It is recommended that 1,500 kroner be allocated to meet the cost of marginal punched cards for filing statistical data relating to effort and yield and facilitating their subsequent examination.

VERSION FRANÇAISE

Rapport et Recommandations du Comité Consultatif.

Président: M. R. S. WIMPENNY.

I. Compte-rendu.

1. Le Président ouvre la séance en souhaitant la bienvenue aux membres. En l'absence du Président du Comité des Poissons Scombriformes on demande au Dr. RAMALHO de présider les réunions de ce comité. Le Président exprime ses souhaits de bienvenue á M. le Professeur SVERDRUP, nouvellement élu Président, ainsi qu'au Dr. BÖHNECKE, son successeur à la présidence du Comité Hydrographique. Le Président exprime ses regrets de voir M. le Dr. HODGSON cesser ses fonctions et lui souhaite une heureuse retraite.

2. Programme de la Réunion.

A la première séance, le Président annonce aux membres que la délégation française a offert de projeter un film très important sur les grandes profondeurs de la Mer Méditerranée, commenté par M. le Professeur PÉRÈS. De plus il est annoncé, qu'une conférence sera faite par M. le Professeur FONTAINE sur les effets de la pollution atomique dans les océans.

Après quelques commentaires, le programme est accepté sous réserve de quelques petites modifications.

3. Rapports des Comités.

Les rapports et recommandations des comités sont discutés et acceptés à la seconde séance; les recommandations comportant des dépenses sont examinées plus particulièrement.

L'attention est attirée sur la suppression de deux sous-comités, le Sous-Comité de la Question des Féroés et le Sous-Comité de la Standardisation des Méthodes de Zooplancton; M. le Dr. TÅNING donne un aperçu du travail exécuté par le Sous-Comité de la Question des Féroés et annonce aux membres, qu'il a été convenu qu'il doit soumettre sur ce travail un rapport qui sera inséré dans les *Rapports et Procès-Verbaux*. (Rec. 1).

La recommandation du Comité du Hareng demandant qu'une réunion spéciale scientifique sur les "Races de Hareng" soit tenue l'année prochaine est discutée. M. le Dr. HODGSON notifie aux membres qu'étant donné que la question des races de hareng est une tâche très vaste, il faudra prévoir trois jours de travail pour les discussions. La Recommandation 2 est adoptée.

M. le Professeur SVERDRUP rend compte de la somme demandé par le Comité Hydrographique. Il a été décidé d'enregistrer les données de surface sur des cartes perforées et grâce à l'offre généreuse faite par l'Institut Hydrographique Allemand qui se chargerait de ce travail, les dépenses seront réduites à environ 9,000 couronnes. De plus, un montant de 1,000 couronnes a été prévu afin de couvrir les frais de voyage de l'Hydrographe pour les besoins de ce travail. Les Recommandations 3 a et b sont approuvées.

Le Secrétaire Général traite de la recommandation du Comité Statistique en expliquant que la somme de 1,500 couronnes sera assignée à l'achat de cartes perforées permettant de compiler et de classer les nouvelles données statistiques relatives à "l'effort de pêche" des secteurs du Conseil. La Recommandation 3c est adoptée.

4. Publications.

A la seconde séance le Président reprend la discussion commencée à la première séance sur les Rapports Administratifs. D'après l'opinion générale, ces rapports constituent un document de haute valeur mais les répétitions devront être évitées et remplacées par des renvois. Il est convenu que le Rapport Administratif continuera de paraître sous sa forme actuelle. (Recommandation 4a).

Au cours de la première séance il fut demandé au membres de présenter à leur comité la question de la poursuite des Cartes Synoptiques Hydrographiques. L'opinion générale reçue est que la publication de ces cartes doit être continuée, éventuellement sous une forme étendue, et qu'elles doivent être distribuées gratuitement aux pays membres. La Recommandation 4b est adoptée.

5. Contributions présentées à la Réunion du Conseil.

Quelques propositions en vue d'une amélioration des réunions sont faites et par suite des nombreuses demandes, cette année, d'exemplaires de contributions présentées aux réunions des comités il est convenu que l'on en fournira l'année prochaine, au moins 150. Une série complète des contributions sera à la disposition de chaque membre assistant à la Réunion du Conseil, et des efforts seront faits pour que les délégués ainsi que les présidents des comités reçoivent la série complète. Il est ensuite décidé, que chaque contribution doit comprendre un résumé de 700 mots au plus. La Recommandation 5 est approuvée.

6. Proposition de la F.A.O.

M. le Dr. TÅNING rend compte du rapport présenté par le Dr. KESTEVEN au Comité des Mers Nordiques Lointaines. Il propose que le Comité Consultatif reconnaisse cette contribution en approuvant une recommandation à la F.A.O. Ceci est adopté. (Rec. 6.)

7. Conférence du Professeur Fontaine.

A la seconde séance, une proposition en français et en anglais d'une recommandation soumise par le

Professeur Fontaine, comme suite à sa conférence sur "La nécessité de protéger les océans contre les dangers de la pollution radio-active" est présentée. Après une correction minime du texte, la recommandation est adoptée à l'unanimité. (Recommandation 7).

8. Nominations et Elections.

M. Finn Devold est nommé Président du Comité du Hareng, pour succéder au Dr. Hodgson; le Dr. Ramalho est nommé Président du Comité des Poissons Scombriformes; le Dr. Böhnecke du Comité Hydrographique et le Professeur Steemann Nielsen du Comité du Plancton. Le Dr. J. H. Fraser est élu Editeur et le Dr. G. Thorson Co-éditeur des *Fiches d'Identification du Zooplancton.*

M. R. S. Wimpenny est réélu Président.

II. Recommandations.

1. Organisation.

a) Le Comité décide la dissolution du Sous-Comité de la Question des Féroés, créé en 1938. Les statistiques actuelles se montrent moins angoissantes qu'autrefois en ce qui concerne les stocks d'aiglefin et de la morue, mais il n'a pas été possible de signaler aucune corrélation notable entre l'augmentation des stocks commerciaux et l'ampleur des stocks qui fraient dans cette région. Il est ensuite décidé, que le Président élaborera un bref rapport qui sera inséré dans les *Rapports et Procès-Verbaux.*

b) Le Sous-Comité de la Standardisation des Méthodes de Zooplancton est dissout.

2. Réunion Scientifique Spéciale.

Il est décidé que les "Races de Hareng" seront le sujet d'une réunion scientifique spéciale, commençant le mardi 27 Septembre 1956 avant la Réunion du Conseil, et qu'il faudra prévoir trois jours de travail pour les délibérations. Organisateur: Prof. A. Bückmann; Rapporteur: M. B. B. Parrish.

3. Enregistrement des Données Hydrographiques et Statistiques.

a) Il est décidé de reporter sur des cartes perforées la collection des données de surface que reçoit la Service Hydrographique. Grâce à une offre généreuse faite par l'Institut Hydrographique Allemand, les dépenses à supporter par le Conseil seront d'environ 9,000 couronnes.

b) Le Comité décide qu'une somme de 1,000 couronnes sera assignée aux frais de voyage relatifs à ce travail pendant l'année courante.

c) Le Comité approuve la recommandation du Comité Statistique, demandant qu'une somme de 1,500 couronnes soit attribuée pour couvrir les frais des cartes perforées pour le classement des données statistiques relatives à "l'effort de pêche" et au rendement, facilitant ainsi leur examen ultérieur.

4. Publications.

a) Il est décidé que les Rapports Administratifs continueront comme par le passé, qu'ils seront brefs et concis, et qu'ils comporteront des renvois, si cela est nécessaire. Le Secrétaire Général est autorisé à éditer les rapports envoyés au Conseil par l'intermédiaire des présidents des comités.

b) La distribution des Cartes Synoptiques Hydrographiques aux membres sera continuée gratuitement; le Comité Hydrographique examinera les possibilités d'étendre le secteur couvert par ces cartes.

5. Contributions présentées à la Réunion du Conseil.

a) Il est décidé que chaque contribution présentée aux comités du Conseil doit comprendre un résumé contenant 700 mots au plus. Ce résumé sera lu aux séances tandisque les contributions distribuées avant la réunion ne seront pas exposées.

b) Au moins 150 exemplaires de chaque contribution présentée à la Réunion du Conseil seront polycopiés.

6. Recommandation à la F.A.O.

Le Comité recommande que toutes les informations du genre indiqué dans la contribution exposée par le Dr. Kesteven de la F.A.O. soient données chaque fois que ce sera possible. Le Comité souligne cependant que nos connaissances sur l'ampleur des ressources aquatiques vivantes, même dans l'Atlantique nord-est pourtant bien exploré, sont très fragmentaires; une coopération sera inévitablement de longue durée. On estime, qu'un recensement des ressources de pêche serait facilité si la F.A.O. pouvait réaliser la recommandation du Comité Consultatif de la Réunion en 1954 sur l'intérêt de créer un service bibliographique et analytique des pêches mondiales.

7. Démarches pour le Bureau.

La recommandation suivante est soumise au Conseil pour être transmise par les voies diplomatiques ordinaires aux pays membres ainsi qu'à toutes les institutions atomiques des Etats-Unis:—

"Le Conseil International pour l'Exploration de la Mer émet le vœu que le dépôt des produits de déchets des industries atomiques dans les eaux marines fasse l'objet d'une réglementation internationale. Le Conseil souhaite vivement que la ou les commissions s'occupant de la destinée des déchets atomiques comprennent des scientifiques spécialistes de l'océanographie physique, chimique, biologique, et de la géologie sous-marine".

8. Informations sur le Merlan.

Le Comité des Mers Nordiques Proches recommande qu'il soit demandé aux pays membres de fournir toutes leurs statistiques sur les prises du merlan (et sur "l'effort de pêche" si possible) pêché par quelque moyen que ce soit, y compris la pêche industrielle. Ces informations seront envoyées au plus tard au mois de Juin 1956 au Secrétariat du C.I.E.M. pour y être polycopiées et distribuées avant la Réunion du Conseil en 1956.

Rapports et Programmes des Comités.

Comité des Mers Nordiques Lointaines.

Président: Dr. Å. Vedel Tåning.

I. Compte-rendu.

Le Président souhaite la bienvenue aux membres et aux personnes invitées, en particulier aux deux observateurs russes, le Dr. Maslov et le Dr. Dmitriev. Le Président rend compte du travail executé dans le secteur et du programme de l'année suivante, évoqué par circulaire.

Quelques questions du Comité Consultatif sont discutés, entre autres les Cartes Synoptiques de la Mer du Nord. Etant donné que les températures portées dans les Cartes Synoptiques actuelles sont hors du secteur du Comité des Mers Nordiques Lointaines, cette question ne concerne pas ce Comité; plusieurs membres soulignent cependant, qu'il serait désirable qu'à l'avenir le secteur couvert par les cartes soit étendu de façon à englober aussi le secteur entier du Comité des Mers Nordiques Lointaines.

Le Dr. Å. Vedel Tåning est réélu Président.

II. Communications.

Les rapports suivants sont présentés et discutés:—

G. L. Kesteven: "Fishing resources of the I.C.E.S.-area."

A. Kotthaus: "Report on the question of overfishing of the redfish."

J. Magnússon: "Some remarks on the propagation of the redfish (*Sebastes marinus*)".

A. Sigurðsson: "Recent investigations on the plaice in Icelandic waters."

Le Comité reçoit avec grand intérêt les informations fournies par le Dr. G. L. Kesteven de F.A.O. de l'U.N. et recommande que toutes les informations de ce genre soient transmises dès que possible. Cependant le Comité insiste sur le fait que nos connaissances sur la masse des ressources aquatiques vivantes, même dans l'Atlantique nord-est pourtant bien exploré, sont très fragmentaires. Pour remédier à ce defaut, le travail doit être organisé sur un programme à long terme.

III. Programme de Travail.

Le Président souligne que les programmes des travaux à la mer doivent être envoyés au Président pour distribution par l'intermédiaire du Secrétaire Général du C.I.E.M.

Allemagne: Le programme sera donné à une date ultérieure.

Angleterre: Le programme sera communiqué par circulaire au mois de Janvier.

Belgique: Pendant ses croisières d'été le garde-pêche ira probablement exécuter un travail hydrologique et planctonique dans les eaux islandaises.

Danemark: Une croisière sera faite par le "Dana" dans les eaux des Féroés en Juin et dans les eaux du Groënland en Juillet; le "Adolf Jensen" et un nouveau petit bateau, le "Tornaq", travailleront durant toute l'année dans les eaux côtières du Groënland.

Ecosse: Un nouveau bateau sera disponible pour les travaux de recherches en 1956. A présent aucun programme détaillé ne peut être donné, mais le travail sera probablement exécuté dans les eaux des Féroés.

France: Un travail d'hydrologie sera exécuté dans les eaux islandaises et groënlandaises.

Hollande: Aucun travail à la mer dans le secteur en 1956.

Islande: Deux bateaux seront disponibles pour les travaux de recherches. Des recherches sur le hareng seront effectuées à l'aide de l'Asdic. Morue et sebaste (frai et échantillonage des captures commerciales). Des marquages côtiers de poissons plats, en particulier en baie de Faxa, seront entrepris. Un programme plus détaillé sera donné au début de 1956.

Norvège: Des travaux de recherches sur la morue, l'aiglefin, et le sebaste, ainsi que des opérations hydrologiques seront effectués dans la Mer de Barentz aux mois de Mars, Avril, Septembre et Octobre.

IV. Le Sous-Comité de la Question des Féroés.

Les membres et les suppléants suivants sont présents:—

Allemagne:	Dr. A. Kotthaus
	Dr. U. Schmidt
Danemark:	Dr. Å. Vedel Tåning
	Dr. E. Bertelsen
	M. J. S. Joensen
France:	M. Cl. Nédélec
Grande Bretagne:	M. R. S. Wimpenny
	Dr. C. E. Lucas
Islande:	Dr. Árni Friðriksson
Norvège:	M. G. Rollefsen

Le Président ouvre la séance à laquelle participent des représentants du Danemark, de la France, de l'Allemagne, de l'Islande, de la Norvège et de la Grande Bretagne.

Se référant aux recommandations de 1948 qui présentaient le programme de travail du Sous-Comité, le Président souligne le fait que cette année il sera possible de faire au Comité des Mers Nordiques Lointaines des recommandations concernant les problèmes ayant été soumis au Sous-Comité.

Des rapports du Danemark et de la Grande Bretagne sur la situation actuelle dans le secteur des Féroés y compris l'estimation des pontes, des larves, ainsi que des stocks de poissons sont présentés. Après une discussion durant laquelle l'on compare ces rapports à ceux qui les ont précédés, le Sous-Comité arrive aux conclusions suivantes:—

1. Les statistiques récentes sont moins angoissantes qu'autrefois en ce qui concerne les stocks d'aiglefin et de morue.

2. Il n'est pas possible de signaler de corrélation notable entre l'augmentation des stocks commerciaux et l'importance des stocks qui pondent dans cette région.

En faisant appel (a) à la mise en vigueur en 1954 par la Commission Permanente de la réglementation de la dimension des mailles de chalut (75 mm.) et (b) à la convention existante entre le Danemark et la Grande Bretagne sur les limites de pêche aux Féroés, le Sous-Comité est d'avis qu'il faut laisser s'écouler quelques années avant que les résultats de ces mesures de conservation puissent être reconnus.

Dans l'espoir que les conditions resteront stables assez longtemps pour permettre une estimation, et comptant que les pays interéssés poursuivront leurs études sur le stock des Féroés, le Sous-Comité recommande:—

1) Qu'il n'est plus nécessaire que le Sous-Comité se réunisse, mais il exprime le souhait que l'état des stocks des Féroés soit l'objet d'attentions particulières de la part du Comité des Mers Nordiques Lointaines. On tiendra compte à la fois des mesures de protection en vigueur et des variations dans le voisinage.

2) Que le Président prépare et publie un bref rapport.

Comité des Mers Nordiques Proches.

Président: Dr. J. Hult.

I. Compte-rendu.

Le Président ouvre la séance et souhaite la bienvenue aux membres et aux visiteurs. Il souligne les difficultés qui se sont élevées à la suite du remaniement des comités adopté en 1954, particulièrement en ce qui concerne les textes pour les Rapports Administratifs et les *Annales Biologiques*; il exprime l'espoir que ces difficultés seront passagères.

La liste des membres est verifiée, mais aucune modification n'y est apportée.

Le Rapport Administratif et les *Annales Biologiques* sont adoptés.

Sur la demande du Président du Comité Consultatif la question de la poursuite des Cartes Synoptiques Hydrographiques est discutée. Les membres de six pays estiment qu'il faut continuer leur publication, et certain d'entre eux sont même prêts à payer pour ces cartes, bienqu'en principe ils s'opposent à un tel procédé.

Le Dr. Hult est réélu Président.

II. Communications.

Les rapports suivants sont présentés et discutés:—

A. Bückmann, G. Hempel et J. Messtorff: "On the abundance and distribution of fish fry in the southern North Sea during March, 1955".

R. J. H. Beverton: "A note on mortality and mesh regulation of North Sea sole".

J. Lundbeck: "Preliminary results on long-period changes in the stocks of some North Sea commercial fish species".

Ingemar Sörensen: "Progress report on the Swedish investigations on whiting in the Skagerak and the Kattegat".

Marine Laboratory, Aberdeen: "Effect of the Danish 'industrial' fishery on the North Sea commercial whiting fishery. Second review, 1955".

J. A. Gulland: "The effect of the Danish industrial fishery on the North Sea catch of whiting for consumption (i. e., above 20 cm.)."

III. Programme de Travail.

Le programme à longue échéance du Comité est discuté et il est décidé que par suite de la nouvelle division des secteurs, il sera nécéssaire d'élaborer un nouveau programme comprenant des extraits des programmes des anciens secteurs de la Mer du Nord et de Transition. Ce programme sera présenté si possible à la réunion de 1956.

Quelques pays membres présentent des programmes provisoires pour 1956 aux membres du Comité; les représentants des autres nations prendront leurs dispositions pour faire parvenir des copies de leur programmes aussitôt que possible au Président qui les transmettra aux membres du Comité.

IV. Recommandation.

Le Comité des Mers Nordiques Proches recommande qu'il soit demandé aux pays membres de fournir toutes leurs statistiques sur les prises du merlan (et sur "l'effort de pêche" si possible) capturé par quelque moyen que ce soit y compris la pêche industrielle, et que ces informations soient envoyées au plus tard au mois de Juin 1956 au Secrétariat du C.I.E.M. pour y être polycopiées et distribuées avant la réunion du Conseil de 1956.

Comité des Mers Baltique-Belts.

Président: Dr. Aa. J. C. Jensen.

I. Compte-rendu.

Le Président souhaite la bienvenue aux membres et aux personnes invitées, en particulier aux observateurs, le Dr. Cieglewicz et M. Mańkowski (Pologne) et Mme Dememtjeva et M. Svetovidov (U.R.S.S.).

Les recherches en cours sont discutées. A la demande du Comité l'observateur polonais et l'observateur russe font un rapport sur l'étendue des travaux actuels de recherches exécutés par leurs pays respectifs dans la Mer Baltique ainsi que de quelques résultats obtenus.

Les engins de pêche standards aux fins de recherche sont discutés dans un Sous-Comité. Il est convenu de préconiser l'emploi des mêmes engins de pêche dans les divers pays opérant dans le secteur du Comité. A ce sujet, le Président enverra dès que possible, des propositions aux membres du Comité par l'intermédiaire du C.I.E.M.

Des épreuves du Rapport Administratif et des *Annales Biologiques* sont soumises aux membres pour correction et approbation.

La poursuite de la publication des Cartes Synoptiques est discutée. Il est convenu qu'elles n'ont aucune valeur directe pour le Comité des Mers Baltique-Belts, mais il est recommandé qu'elles soient continuées sur la meilleure base économique possible.

Les rapports sont présentés et discutés. Le Comité estime que les conséquences d'une transplantation du saumon pacifique dans la Baltique doivent faire l'objet d'un examen très approfondi.

II. Communications.

Les rapports suivants sont lus et discutés:—

S. Sahlin: "Tagging of eel at the south coast of Scania".

F.A.O., Biology Branch: "Possibilities of transplanting species of Pacific salmon into the Baltic".

G. Alm: "Swedish salmon fisheries in the Baltic precincts in the last years".

Aa. J. C. Jensen: "Productivity of the various regions of the sea with special reference to the Baltic-Belts".

K. Banse: "On the behaviour and distribution of Polychaetes and echinoderm larvae in the Kiel Bay".

A la demande du Comité, Mme T. Dementjeva lit un rapport sur les recherches faites par l'U.R.S.S. sur les stocks du hareng et de la morue en Baltique et le Dr. Cieglewicz expose la contribution de M. Mulicki, "Les migrations de la morue dans la Baltique du sud."

III. Programme de Travail.

Il est décidé de poursuivre le programme de l'année précédente pendant l'année à venir.

Le Comité insiste sur la nécessité de déterminer le phosphate et si possible, le nitrate. Il est convenu d'étudier de façon plus approfondie l'influence des facteurs hydrologiques sur les fluctuations des stocks de poisson.

Le Comité recommande que les marquages de morue et de hareng soient poursuivis et étendus.

Comité Atlantique.

Président: Dr. J. Furnestin.

I. Compte-rendu.

La liste des membres du Comité est revue, le Rapport Administratif adopté, les *Annales Biologiques* corrigées, et les communications annoncées.

Le Dr. J. Furnestin est réélu Président.

II. Communications.

R. Letaconnoux: "Conditions hydrologiques au large du Cap Finisterre, sur les lieux de pêches".

R. Moal: "Note sur les températures de surface observées dans la baie du Repos (Mauritanie) en 1953—1954".

Vincent-Cuaz: "Les particularités hydrologiques de l'année 1954 d'après une station mauritanienne".

G. Kurc & de la Tourrasse: "Détection des thons rouges (*Thunnus thynnus* L.) par les ultra-sons".

R. Coupé: "Remarques sur la sexualité chez les *Pagellus acarne* Risso des côtes marocaines".

R. Moal: "Observations sur la courbine (*Sciaena aquila* Lacèp.) dans la région de Port-Etienne".

C. Maurin: "Les merlus du Maroc et leur pêche".

W. Geiger: "Le cerveau de *Merluccius merluccius* (L.) et de *Merluccius senegalensis* Cadenat. Contribution à l'étude comparative des deux espèces".

A. Ramalho: "Statistiques de pêche au chalut au Portugal, et en Mauritanie".

III. Considérations diverses et Programme de Travail.

Il est constaté, que la séparation complète des Comités Sardine, Scombriforme, et Atlantique gène le travail du Comité Atlantique. Les membres présents sont d'accord avec les Présidents de ces trois comités pour estimer, que le Comité Atlantique doit traiter des questions concernant les Scombriformes et les Clupéiformes, lorsqu'elles débordent du cadre particulier à la morphologie et la biologie des espèces.

Il est décidé de mettre au programme de 1956 l'étude des espèces de Sparidés et de Scienidés, importantes pour la pêche au chalut, notamment *Pagellus centrodontus*, *Dentex marocanus* et *Sciaena aquila*.

Comité des Pêches Comparées.

Président: Dr. C. E. Lucas.

I. Compte-rendu.

Le Président souhaite la bienvenue aux membres, aux observateurs ainsi qu'aux autres personnes présentes. Des représentants de l'Allemagne, de l'Angleterre, du Danemark, de l'Ecosse, de la Finlande, de la France, de l'Islande, de la Norvège, des Pays Bas, et de la Suède assistent à la réunion. Ils précisent qu'aucune modification ne sera apportée à la représentation de leur pays.

Le Président remercie les membres d'avoir fourni les documents pour le Rapport Administratif, dont les épreuves sont à leur disposition. Ce rapport est satisfaisant, et le Comité estime qu'aucune place ne doit être laissée dans les *Annales Biologiques* aux rapports des travaux de recherches.

Quelques pays participants seulement ont soumis leur programme provisoire de recherche; les autres participants assurent que les leurs seront prêts dans les plus brefs délais. Ces programmes circuleront dès que possible afin de pouvoir les coordonner et procéder à des échanges de vues.

Le Comité est très heureux de constater, que le Dr. Kristjonsson de F.A.O. assiste à la séance. Ce dernier renseigne le Comité sur un projet de F.A.O. d'une réunion mondiale. Il signale, que, bienque jusqu'ici aucune décision définitive n'ait été prise, les sujets suivants seraient débattus (a) étude des engins de pêche, (b) caractéristiques des fibres naturelles et synthétiques et détection des bancs de poissons, le tout étant dominé par la biologie des espèces comestibles. La F.A.O. poursuivra aussi la distribution des informations sur les nouveautés techniques et sur les recherches. Cet organisme a l'intention d'attirer l'attention, aussi bien des pays sous-développés que des pays evolués, sur les ressources importantes dont ils disposent afin d'assurer un rendement maximum de la pêche.

Avant que les contributions scientifiques ne soient présentées, le Président rappelle aux membres (a) la responsabilité imposée au Comité par le Comité Consultatif de fournir et fixer les calculs de "l'Effort de Pêche" et (b) la demande du Comité de Liaison reclamant des données récentes sur les chaluts "légers", leur définition, les essais et leur sélectivité.

Au cours de l'importante discussion qui s'ensuit,

on reconnait le grand intérêt d'avoir pu faire circuler prèsque toutes les contributions avant la réunion. Voir ci-dessous la liste des rapports. De plus le Dr. JENSEN expose ses expériences et observations faites sur la dimension des mailles et par un bref exposé, le Dr. CARRUTHERS présente au Comité un rapport publié recemment sur l'appareil qu'il a construit dans le but de mesurer l'inclinaison et la déviation des funes de chalut, des cordes de clos, etc.

II. Communications.

1. *Effort de Pêche.*

J. A. GULLAND: "On the measurement of demersal fishing effort", No. 32.

J. A. POPE: "Fishing power and fishing effort of vessels landing at Aberdeen", No. 35.

2. *Sélectivité des Mailles.*

J. FURNESTIN: "Expériences sur les maillages des chaluts", No. 67.

A. R. MARGETTS: "Interim report on the selection by trawl cod-end meshes made on various materials", No. 43.

A. R. MARGETTS: "Definition and test of light trawl", No. 65.

3. *Dimension des Mailles.*

A. v. BRANDT: "Measurements of meshes of trawl nets", No. 40.

B. B. PARRISH, R. JONES, and J. A. POPE: "A comparison of mesh measuring methods", No. 34.

R. BEVERTON: "Measurement of net meshes", No. 64.

4. *Forces Dynamiques et Comportement des Filets.*

J. H. STEELE: "Review of theoretical studies on a trawl", No. 15.

J. SCHÄRFE: "New German investigations on trawling gear", No. 41.

5. *Réaction des Poissons.*

J. SCHÄRFE: "Echo-sounder records on the behaviour of fishes towards warps", No. 42.

1. A la suite d'une discussion intéressante sur l'effort de pêche il est décidé de demander au Comité Consultatif d'attirer l'attention du Comité Statistique sur les deux contributions présentées. Des informations de valeur ont été recueillies par plusieurs pays et le Président exprime l'espoir qu'en 1956 un assez grand nombre de contributions soient présentées pour permettre l'élaboration de comparaisons préliminaires mais importantes sur l'efficacité des engins de pêche les plus utilisés.

2. Les trois contributions sur la sélectivité des mailles déclenchent un échange de vues très utile. Une importante discussion très suivie s'élève au sujet des chaluts "légers". Au cours du débat il est reconnu, qu'il sera necéssaire d'obtenir bien plus de précisions pour définir les matériaux et les procédés, et surtout d'effectuer de nouvelles recherches avant qu'aucune définition précise ne soit donnée.

3. Les quatres contributions sur la dimension des mailles ainsi que celle de Dr. BOEREMA en 1954 sont étudiées et critiquées, et les membres sont avisés qu'au début de 1956 l'I.C.N.A.F. discutera de sujets analogues. Bienque les opinions soient actuellement divergentes sur des points importants, il y a cependant une unité de vues parmi les membres du Comité.

4. Les trois contributions portant sur les forces dynamiques et le comportement des filets montrent (a) que l'on a obtenu à présent des données précieuses relatives aux filets commerciaux en action et (b) que ces résultats gagneront en importance s'ils sont complétés par des études théoriques et expérimentales sur l'hydrodynamiques de modèles et de filets de grandeur naturelle.

5. La dernière contribution, mais non la moindre, décrit l'expérience ingénieuse et efficace faite pour observer la réaction des poissons au chalut à l'aide des écho-sondeurs installés soit dans un bateau de recherche soit dans un canot pneumatique suivant le chalutier.

En fin de séance le Président adresse ses remerciements aux participants présents ou absents, ainsi qu'à ceux qui ont pris part aux débats permettant ainsi une réunion des plus animées.

Le Dr. C. E. LUCAS est réélu Président.

III. Recommandations.

Les recommandations suivantes sont adoptées:—

1. Bien qu'il ne soit pas possible actuellement de fournir une définition complète du chalut "léger", on peut dire, d'une manière provisoire, que le chalut léger est un engin fait en coton ou en chanvre (*Cannabis sativa*),

En l'absence de données sur la sélectivité, il n'est pas possible d'inclure actuellement dans les définitions des filets construits totalement ou en partie en nylon, perlon ou autres fibres synthétiques; il est reconnu qu'il sera peut-être nécessaire de tenir compte d'autres facteurs, tels que la puissance, les mailles en fil double ou simple, la dimension du fil et son traitement. Il est convenu de procéder dès que possible à des expériences afin d'obtenir ces données inconnues.

2. Il est recommandé d'autre part d'attirer l'attention de la Commission Permanente sur le fait qu'il faudrait obtenir une plus grande uniformité de la mesure des mailles par des jauges développant une pression longitudinale directe et invariable d'environ 3 kilos. De telles jauges seraient utiles pour mesurer les mailles des poches en fils de manille, de sisal et de chanvre. Des jauges de ce genre ont déjà été construites.

Comité des Poissons Gadoïdes.

Président: M. G. Rollefsen.

I. Compte-rendu.

Les pays suivants sont représentés:— l'Allemagne, l'Angleterre, le Danemark, l'Espagne, l'Islande, la Norvège et l'Ecosse. Une modification est établie dans la composition du Comité: l'Allemagne est représentée par le Dr. U. Schmidt au lieu du Dr. Lundbeck.

L'U.R.S.S. est représentée par deux observateurs: Ms. Maslov et Svetovidov.

Le Président souligne les fonctions du Comité des Poissons Gadoïdes et fait mention de quelques questions réclamant l'attention immédiate du Comité. Quelques autres questions de grande importance sont à prévoir et le Comité doit essayer de dégager les problèmes susceptibles de se présenter dans un avenir proche.

Le Comité est d'avis que la valeur des Cartes Synoptiques paraît plutôt limitée, et estime qu'il faut étudier attentivement la possibilité de les éditer à un prix moins élevé.

Le Comité des Poissons Gadoïdes estime qu'à sa prochaine séance il serait d'un grand intérêt de recevoir des contributions sur la biologie du merlu et sur l'état actuel de la pêche du merlu, se rapportant plus particulièrement aux statistiques commerciales de rendement et d'effort de pêche.

II. Communications.

Les travaux suivants sont présentés:—

P. M. Hansen: "The stock of cod in Greenland waters, 1955". (Preliminary report).

Jón Jónsson: "Relationship between temperature and growth of Icelandic cod".

U. Schmidt: "Contribution to the biology of the coalfish in Norwegian waters".

G. Sætersdal: "Preliminary report on cod marking experiments in the Barents Sea".

N. A. Maslov: "Age and size distribution of cod and haddock in pre- and post-war years".

Steinar Olsen: "Norwegian activities in coalfish investigations, 1954—55".

Comité du Hareng.

Président: Dr. W. C. Hodgson.

I. Compte-rendu.

La liste des membres est verifiée et quelques amendements acceptés. Le Rapport Administratif et les *Annales Biologiques* sont présentés et adoptés.

Le Président rend compte des résultats de la demande faite aux membres de fournir des données d'écho-sondages sur le hareng, suivant la Recommandation 2, 1954. Un seul jeu de données a été reçu au cours de l'année et les membres sont à nouveau priés de receuillir le matériel et de le transmettre au Président.

Les rapports sur le travail fait par chaque pays pendant l'année sont présentés. Le Président remercie d'une part les membres du Comité Editorial d'avoir élaboré le texte du Rapport sur les Echo-Sondages, et, d'autre part, le Secrétaire Général et son personnel qui ont assuré la publication de ce travail.

Le Comité recommande la poursuite des Cartes Synoptiques et — si possible — gratuitement.

Le Dr. W. C. Hodgson abandonne la présidence du Comité et M. Finn Devold est élu Président.

II. Communications.

Les rapports suivants sont lus et discutés:—

O. Dragesund: "Herring tagging experiments in Norway, 1954—55".

J. Ancellin: "Hareng du sud de la Mer du Nord et de la Manche Orientale". (Lu par Cl. Nédélec).

Ch. Gilis: "Evolution de la pêche belge aux harengs dans la Mer du Nord au cours des années 1950 à 1955".

Á. Friðriksson: "The north coast herrings of Iceland in 1955".

F. Devold: "Scandinavian herring periods".

III. Recommandation.

Le Comité du Hareng recommande qu'une réunion spéciale scientifique sur les etudes des "Races de Hareng" soit tenue au cours de la réunion en 1956.

Comité de la Sardine.

Président: J. Cuesta.

I. Compte-rendu.

Le Prof. Bückmann est inclu dans la liste des membres du Comité.

Le Rapport Administratif (1954) est approuvé. Pas des remarques sur les *Annales Biologiques*.

Les membres du Comité donnent des renseignements sur les travaux réalisés par leurs pays respectifs. Quant aux travaux à entreprendre l'année prochaine le Comité est d'accord pour les concentrer autant que possible sur les problèmes concrets. Dans ce but le Président est chargé de préparer un plan au plus tôt.

Le Dr. Ramalho suggère, qu'il serait convenable de faire circuler entre spécialistes certains échantillons tels que écailles, etc.

Au point de vue les Cartes Synoptiques, le Comité considère, qu'elles ne sont pas d'un grand intérêt pour le Comité, étant donné que les zones sardinières les plus importantes sont en dehors de la région considérée dans les cartes.

Le Dr. Cuesta est réélu Président.

II. Communications.

Les communications suivantes sont présentés et discutés:—

R. C. Garcia Cabrera & F. Navarro: "Premières données sur la sardine de Teneriffe (Iles Canaries)."

M. Rossignol: "Biologie des sardinelles de la région de Pointe-Noire. Résumé de nos connaissances."

J. Cuesta: "La présence de *Scolex polymorphus* dans l'anchois (*Engraulis encrasicholus*)."

Comité des Poissons Scombriformes.

Président: Dr. A. M. Ramalho.

I. Compte-rendu.

Le Prof. Frade étant absent, le Dr. Ramalho le remplace, avec l'accord du Comité, jusqu'à l'élection du nouveau président. La liste des membres est corrigée avec le changement de quelques noms. Le Rapport Administratif et les *Annales Biologiques* 1954 sont présentés et adoptés.

Un projet de programme général préparé et distribué en Février 1955 par le Prof. Frade et les suggestions envoyées par M. A. C. Simpson en Avril, sont présentés et discutés.

Le Dr. A. M. Ramalho est élu Président.

II. Communication Scientifiques et Présentation de Films.

A. Communications.

Germon.

A. Figuéras: "Renseignement sur l'âge et la croissance du Germon (*Germo alalunga* Gmelin)".

J. M. Navaz: "Le Thon rouge (*Thunnus thynnus* L.) et le Germon (*Germo alalunga* Gml.) de la côte Basque (1954)."

Thon Rouge.

K. Tiews: "Über die Anzahl der Kiemenreusenfortsätze bei Roten Thunfischen (*Thunnus thynnus* L.) die im September 1955 in der Nordsee gefangen wurden."

J. Furnestin et collaborateurs: "Croissance linéaire et pondérale du jeune Thon rouge du Maroc".

Pêches.

P. F. Meyer-Waarden: "Deutsche Thunfischuntersuchungen".

F. Ruesgas-Cabañas: "A new method of fishing in the northwest of Spain".

B. Films.

1. "Un 'Tuna-Clipper' dans les eaux africaines". (Institut Scientifique du Maroc).
2. "Long-line fishing for tuna in the Gulf of Mexico". (Fish and Wildlife Service, U.S.A.).

III. Programme de Travail.

Tout en admettant la nécessité d'un programme général, le Comité estime qu'il est plus efficace de limiter les études pour 1956 à un objectif restreint. En conséquence, il décide de considérer sans exclusion d'autres questions, les points suivants; concernant le Germon et le Thon rouge: (a) Marquage, pour l'étude des migrations, de jeunes Thons sur la côte marocaine et dans le Golfe de Gascogne, de Thons adultes en Mer du Nord. (b) Observations de l'état de développement des glandes sexuelles. (c) Mensurations des poissons en vue de l'étude de la croissance et des stocks exploités.

Comité du Saumon et de la Truite.

Président: Dr. A. E. J. Went.

I. Compte-rendu.

Le Président souhaite la bienvenue aux membres et aux visiteurs et la liste des membres est revue. Le rapport présenté par la F.A.O. sur "Les possibilités de transplanter des espèces du saumon pacifique dans la Mer Baltique" est discuté. Les autorités suédoises s'étant engagées dans un programme étendu d'élevage et de peuplement artificiel du saumon atlantique pour compenser la diminution des possibilités de frai naturel causée par le développement hydro-électrique des rivières suédoises, il est convenu qu'il ne serait pas opportun de permettre la réalisation de telles transplantations, même sur une petite échelle. En outre les membres soulignent l'insuffisance de nos connaissances sur de nombreux facteurs déterminant le développement des stocks du saumon atlantique dans la Baltique ainsi que dans l'Europe occidentale en général.

Le Comité discute brièvement de l'apparition dans divers pays d'Europe de quelques maladies chez la truite arc-en-ciel des établissements d'élevage. Il est décidé que des dispositions seront prises pour permettre, au cours des prochaines réunions, un échange de vues sur les maladies du saumon et de la truite particulièrement chez les poissons élevés artificiellement.

Les représentants suédois annoncent que le Comité Suédois des Poissons Migrateurs a engagé deux savants qui étudient maintenant la physiologie de "smoltification" du saumon. Le Comité invite les représentants suédois à soumettre à la prochaine réunion un rapport sur l'avancement de ces travaux, de préférence un rapport oral exposé par un des savants qui s'en occupe.

II. Communications.

F.A.O. Biology Branch, Fisheries Division: "Possibilities of transplanting species of Pacific salmon into the Baltic Sea".

B. Carlin: "Tagging of salmon smolts in the River Lagan".

R. Vibert: "Laboratory methods for studying and increasing survival in the wild of hatchery reared trout and salmon fry".

III. Excursion proposée en 1956.

Le Président annonce que les représentants suédois ont proposé une courte excursion (ne durant qu'un jour) de Copenhague à la rivière Lagan en Suède à l'occasion du prochain congrès du Conseil. Le Comité remercie la Suède de cette offre qu'il est heureux d'accepter et les dispositions à prendre pour cette excursion sont laissées aux soins du Président et du Dr. B. Carlin.

IV. Programme de Travail.

Le Comité décide de poursuivre le marquage de saumons "clean" en mer, "smolts" et "kelts", conformément au programme arrêté au cours des années antérieures. On souligne la nécessité de faire des essais sur l'efficacité relative des différents types de marques pour "smolts". Il est convenu qu'un tel travail sera effectué dans le plus grand nombre de régions possible. Dans ce but les membres sont d'accord pour échanger des marques dans la mésure du possible.

V. Recommandation.

Le Comité est d'avis que le Rapport Administratif se rapportant aux activités de chaque pays est un document de haute valeur car il est aujourd'hui la seule source d'information de l'avancement des recherches sur le saumon et la truite en Europe. Il est en conséquence vivement recommandé que le Rapport Administratif soit à l'avenir imprimé sous la même forme que celle adoptée jusqu'ici.

Comité des Mollusques et Crustacés.

Président: Dr. B. Havinga.

I. Compte-rendu.

Le Président ouvre la séance en souhaitant la bienvenue aux membres, en particulier aux membres suédois, présents pour la première fois.

La liste des membres est arrêtée sans d'autre changement que le remplacement de M. R. Ladouce par M. P. Trochon.

Le Rapport Administratif et les *Annales Biologiques* sont adoptés sous réserve d'une petite correction.

Les programmes pour 1956 sont discutés et le Président souligne l'intérêt qu'il y a à les recevoir à temps de façon à pouvoir les distribuer aux membres des divers pays.

Les membres du Comité des Mollusques et Crustacés

reconnaissent qu'ils ne se servent pratiquement pas des Cartes Synoptiques.

Le Dr. B. Havinga est réélu Président.

II. Contrôle Sanitaire.

Au cours de la réunion en 1954 il fut décidé de faire une étude comparative des méthodes employées pour le contrôle sanitaire des coquillages dans les divers pays s'intéressant à ce sujet. Une telle étude ayant été faite en Angleterre et dans les Pays-Bas, le Comité reçoit des rapports sur les résultats obtenus, l'un du Dr. N. Reynolds & P. C. Wood et un autre du Dr. Grijns. En outre, M. P. Trochon fait mention d'une nouvelle méthode à l'Institut Pasteur de Paris. Il est convenu, que ces rapports seront soumis à une étude comparative et que les résultats seront présentés à la prochaine réunion.

III. Communications.

B. Andreu & P. Arté: "Expériences sur le contrôle et fixation des larves d'huîtres plate (*O. edulis*) et sur le détroquage et la croissance des jeunes huîtres dans la Ría de Vigo (NO. d'Espagne)".

L. Marteil: "Répartition actuelle de *Mytilicola intestinalis* St. sur la côte sud de Bretagne."

P. Trochon: "Prévision de la date probable de la première émission de larves d'huîtres dans la région de la Seudre."

A. Figuéras: "Les pigments des plages comme indice de leur production."

P. C. Wood: "Factors affecting the pollution and self-purification of molluscan shellfish in a polluted estuary."

H. A. Cole: "Preliminary study of growth rate in cockles in relation to commercial exploration."

J. A. Pope: "Body form and weight-length relationships in the lobster (*Homarus vulgaris* Edw.)."

Le Dr. Cole, le Dr. Millar et le Dr. Vilela montrent une série d'une cinquantaine de photos prises en 1954 en France aux centres ostréicoles et mytilicoles.

Comité Hydrographique.

Président: Prof. H. U. Sverdrup.

I. Compte-rendu.

La liste des membres du Comité est revue. Le Dr. I. Hela, Finlande, remplace le Dr. Granqvist. L'Amiral Termijtelen (Pays-Bas) se retire du Comité. A cette réunion, l'Ecosse est représentée par M. R. Johnston. Le Dr. Lednev (U.R.S.S.) assiste en tant qu'observateur.

Le Rapport Administratif du Comité pour 1954 est approuvé. A ce sujet le Président fait savoir aux membres que le Comité Consultatif a pris en considération une réduction du nombre des rapports des Comités. Le Président est, cependant, d'avis que les rapports des comités fonctionnels ne doivent pas être suspendus vu qu'ils contiennent des notes qu'il serait utile d'examiner ultérieurement.

Le rapport de l'Hydrographe sur le travail effectué par le Service Hydrographique depuis la dernière réunion est présenté.

A ce propos, le Président fait savoir que le Président du Comité Consultatif demande aux Présidents des différents Comités de réunir de plus amples renseignements que ceux rassemblés à ce jour sur la valeur des Cartes Hydrographiques Synoptiques.

Le Comité décide d'envoyer au Comité Consultatif la déclaration suivante:—

"Le Comité Hydrographique reconnaît que le but principal des Cartes Synoptiques est de fournir aux spécialistes de la biologie marine des informations utiles à leurs études. A ce propos le Comité Hydrographique désire préciser, qu'une longue série de ces cartes pourrait être d'un intérêt certain si l'on devait examiner les relations entre l'hydrographie et la biologie marine. L'effort accompli actuellement pour établir les cartes épargnera probablement de lourdes dépenses le moment venu. C'est pourquoi on ne doit pas prendre trop précipitamment position sur l'intérêt des cartes.

Le Comité Hydrographique désire aussi exprimer l'idée qu'une longue série de Cartes Synoptiques fournira un matériel unique pour l'étude des questions touchant les relations entre l'atmosphère et la mer. Elles auront donc une valeur scientifique pour des branches de la science hors du domaine de l'activité du Conseil."

A propos du rapport sur les travaux du Service Hydrographique le Comité, sur la proposition du Lt.-Cdr. Lumby, exprime sa satisfaction sur l'importance et la qualité du travail exécuté au cours de l'année dernière.

Le Lt.-Cdr. Lumby rend compte du travail effectué par le Sous-Comité pour la Préparation des Cartes Définitives des Moyennes de Température et de Salinité de Surface.

La Recommandation 1 est adoptée. Le Comité exprime à l'Institut Hydrographique Allemand sa gratitude pour l'offre généreuse relative au report des donnés sur des cartes perforées.

Le Sous-Comité comprenant Ms. Lumby (Président), Dietrich et Groen consent à fonctionner comme Sous-Comité consultatif pour le travail si la Rec. 1 est adoptée par le Conseil.

M. Hermann rend compte du travail effectué par

le Sous-Comité chargé d'une révision de la Méthode Standard de Détermination de la Salinité.

La Recommandation 2 est adoptée. De plus le Comité recommande qu'une démarche soit faite pour emprunter un pont de Wenner pour la détermination de la salinité, afin d'obtenir des expériences sur cette méthode à l'une des institutions participant aux travaux du Conseil.

Le Dr. Böhnecke et Lt.-Cdr. Lumby rendent compte du travail du Sous-Comité pour l'Année Géophysique Internationale 1957—58 (A.G.I.). Pendant cette réunion du Conseil, le Sous-Comité a contacté les représentants des pays qui, selon toute probabilité, prendront part au travail effectué sous les auspices du Conseil, pour compléter et coordonner les programmes. La perspective générale est pleine de promesses. La coopération proposée par l'U.R.S.S. est hautement appréciée.

Le Dr. Hela propose que des études soient effectuées pendant l'A.G.I. sur les échanges d'eau entre la Baltique et les mers adjacentes.

Le Dr. Lednev donne un aperçu général des plans de l'U.R.S.S. Le programme détaillé sera à la disposition du Conseil probablement en Décembre de cette année.

La Recommandation 3 est approuvée. Sur la proposition du Président, l'U.R.S.S. et le Danemark sont appelés à nommer des membres pour le Sous-Comité.

Le rapport de l'Hydrographe sur l'incorporation dans le *Bulletin Hydrographique* des observations recueillies par le bathythermographe est présenté.

Le Commandant Collins propose que les positions et les dates des observations BT soient incorporées dans le *Bulletin Hydrographique*.

La résolution suivante est approuvée:—

"Le Comité Hydrographique recommande que, conjointement à la remise des données habituelles destinées à la publication dans le *Bulletin Hydrographique*, les positions et les dates des observations recueillies du bathythermographe, qui complètent les données de température obtenues par thermomètre, soient soumises au Service Hydrographique pour publication."

Après une discussion sur les diverses méthodes qui permettraient de distribuer les observations BT, il est proposé de créer un Sous-Comité pour examiner plus sérieusement cette question. Le Dr. Groen (faisant fonction de Président) et le Dr. Kullenberg sont nommés membres du Sous-Comité, l'Islande et l'U.R.S.S. sont invitées à nommer chacune un membre.

Des programmes provisoires des travaux hydrographiques dans les divers pays sont exposés.

L'Hydrographe présente un aperçu des observations de routine effectuées sur les trajets déterminés ou aux stations fixes par les bateaux de recherches, les navires de commerce, les bateaux feux, etc. . . . Une liste révisée des profondeurs standards à adopter pour les observations a été distribuée.

Comme le Professeur Sverdrup doit se retirer du Comité, un Sous-Comité *ad hoc*, composé de Ms. Desbrosses, Lumby et Thomsen est créé pour la nomination d'un nouveau président. Sur la proposition de de ce Sous-Comité le Dr. Böhnecke est élu Président.

De la part du Comité le Dr. Böhnecke exprime sa profonde gratitude au Professeur Sverdrup pour son travail effectif dans le Comité Hydrographique et ses efforts pour rendre l'hydrographie la plus utile possible aux autres sections du Conseil.

En remerciant, le Professeur Sverdrup précise qu'en plus de développer le travail du Comité Hydrographique, il s'est efforcé d'augmenter l'activité hydrographique dans les autres comités. Comme le Comité Hydrographique prospecte le milieu des organismes étudiés par les autres comités du Conseil, son travail est fondamental pour eux.

II. Communications.

Sous la présidence du Dr. Böhnecke, les communications suivantes sont présentées:—

M. Roessingh: "Sex ratio in copepods as an indicator of the waterflow along the Dutch coast". (Présenté par M. Boerema).

J. N. Carruthers: "Some further current-measuring procedures of fisheries interest". Ms. Böhnecke et Dietrich prennent part à la discussion.

G. Dietrich: "Some features from the circulation in the Irminger Sea in June 1955". Ms. Böhnecke, Hermann, Dietz, Groen, Lumby, Carruthers et Collins prennent part à la discussion.

G. Dietrich: "Some hydrographic results of a multiple ship survey in the southern North Sea in March 1955." Ms. Böhnecke, Lumby et Carruthers prennent part à la discussion.

G. Berrit: "Comparaison des conditions hydrologiques à Pointe-Noire et à Dakar." (Présenté par M. P. Desbrosses).

J. E. Fjeldstad: "Eddy viscosity, current and wind". Ms. Kullenberg, Carruthers et Sverdrup prennent part à la discussion.

III. Recommandations.

1. Le Comité Hydrographique recommande:—
   (a) Que la collection des observations de surface du fichier du Service Hydrographique soit reportée sur cartes perforées.

   A la suite de l'offre généreuse de l'Institut Hydrographique Allemand, les dépenses du Conseil n'excèderont pas 9000 Kr.
   (b) Que la préparation des cartes des moyennes soit entreprise conformément aux méthodes proposées par le Sous-Comité créé pour l'examen de cette question. Grâce à l'offre de l'Institut Hydrographique Allemand, ce travail peut être considéré comme une tâche normale du Service Hydrographique; en conséquence le Conseil n'aura pas à supporter de dépense supplémentaire.

(c) Qu'une allocation de 1000 Kr. soit accordée pour les frais de voyage relatifs aux travaux de cette année.

(d) Qu'un Atlas de cartes et des tableaux soient publiés; les frais seront très approximativement de 3500 Kr. pour 500 exemplaires de l'Atlas + 6700 Kr. pour le même nombre de tableaux.

(e) Qu'un Sous-Comité consultatif soit créé pour aider à orienter le travail.

2. Le Comité Hydrographique après avoir examiné le rapport soumis par son Sous-Comité recommande:—

(a) Qu'une nouvelle description de la méthode Mohr-Knudsen soit élaborée comme méthode standard pour les déterminations normales de la salinité. La description devra comprendre les modifications généralement apportées, et qui ne diminuent pas la précision de la méthode, à savoir, l'usage d'un agitateur magnétique et d'un indicateur de fluorescéine. La description devra comprendre aussi le type de burette et de la pipette à utiliser.

(b) Le Sous-Comité, institué en 1954 pour considérer une révision de la technique d'analyse, continuera ses fonctions et complétera la rédaction de la méthode standard pour sa publication.

3. L'Année Géophysique Internationale (A.G.I.).

(a) Le Comité Hydrographique recommande que le Conseil International pour l'Exploration de la Mer (C.I.E.M.) participe à un programme quasi-synoptique de la partie septentrionale de l'Atlantique Nord pendant l'A.G.I., plus particulièrement de la région du front polaire.

(b) A propos du rapport de son Sous-Comité pour l'A.G.I. et des discussions avec les représentants des pays participants, le Comité Hydrographique recommande que les travaux soient effectués au moins deux fois au cours de l'A.G.I., à savoir, en Mars et en Septembre 1958, chaque fois + 1 mois.

(c) Considérant les lacunes des programmes en question et la bonne volonté de la part des pays participants, le Comité Hydrographique recommande que le Sous-Comité continue ses fonctions afin que les programmes soient complétés et coordonnés.

(d) Le Comité Hydrographique recommande que le Conseil International pour l'Exploration de la Mer prenne contact avec la Commission Internationale des Pêcheries de l'Atlantique Nordouest (I.C.N.A.F.), qui a exprimé sa volonté de coopérer. Il lui sera demandé de nommer des membres à ce Sous-Comité pour que les programmes des deux organismes soient coordonnés.

(e) Admettant l'importance de la recherche proposée par l'Institut Finlandais pour l'Exploration de la Mer, sur les échanges d'eau entre la Baltique et les mers adjacentes, le Comité Hydrographique recommande que ce travail soit effectué, mais il le juge du ressort de l'Association Internationale d'Océanographie Physique (Comité Spécial pour l'Année Géophysique Internationale).

Errata.

Rapp. et Proc.-Verb., **124**, I, p. 63:
Recommandation 3 (e): Les profondeurs 150 et 3000 mètres seront inclues dans la série des profondeurs standardes.

Rapp. et Proc.-Verb., **138**, I, p. 47:
Recommandation 3 (d): La profondeur 50 mètres sera inclue dans la série des profondeurs standardes.

Comité du Plancton.

Président: Prof. T. Braarud.

I. Compte-rendu.

Les rapports sur les travaux effectués en 1954 sont adoptés. On discute de l'avancement de la publication des *Fiches d'Identification du Zooplancton* en s'appuyant sur un rapport du Dr. G. Thorson; les membres du Comité sont priés d'aider l'éditeur des fiches à trouver des auteurs pour de nouvelles fiches. Le Comité propose que le Dr. J. H. Fraser soit nommé Editeur et le Dr. G. Thorson Co-éditeur des *Fiches d'Identification du Zooplancton.*

En réponse à la demande du Comité Consultatif, le Comité déclare à l'unanimité des membres que les Cartes Synoptiques sont très utiles et qu'elles seront très précieuses pour les études futures du plancton dans le secteur couvert par les cartes. On recommande que les cartes soient fournies gratuitement, si possible.

Le Sous-Comité de la Standardisation des Méthodes du Zooplancton est dissout.

M. le Prof. E. Steemann Nielsen est élu Président pour l'année à venir.

II. Communications.

C. Rees: "The distribution of *Calanus* in relation to currents and other hydrographic conditions off the Norwegian coast".

V. Hansen: "Zooplankton and hydrography in the southern part of the Norwegian Sea".

M. Roessingh & J. F. de Veen: Observations on the patchiness of plaice eggs". (Lu par M. Boerema).

C. Rees: "The relative distribution of *Calanus finmarchicus* and *C. helgolandicus* in the North Sea, Norwegian Sea and Atlantic".

J. Krey: "Comparative studies of the standing crop of plankton biomass in coastal waters".

E. Steemann Nielsen: "Investigations on the production of organic matter in Danish and Greenlandic waters".

P. T. Marshall: "Phytoplankton production in the western Barents Sea 1949 to 1954".

S. le Roux: "Observations sur les phytoplanctons du Bassin d'Arcachon dans des conditions de brusques variations hydrologiques". (Lu par M. P. Desbrosses).

M. Rossignol: "Sur la présence d'Ebriédiens dans le plancton de la baie de Pointe-Noire (A.E.F.)". (Lu par M. P. Desbrosses).

Vincent Cuaz: "Premières observations de plancton brun sur les côtes de Mauritanie, ses conditions d'apparition". (Lu par M. P. Desbrosses).

G. Berge: "Green water and mass production of *Coccolithus Huxleyi* along the west coast of Norway during May—June 1955".

Suit une discussion de l'influence de l'apport atlantique sur l'hydrologie et sur le plancton de la Mer du Nord et de la Mer de Norvège en 1955.

Comité Statistique.

Président: Dr. J. C. Lundbeck.

I. Compte-rendu.

Le *Bulletin Statistique* pour 1953, qui sera le premier volume édité par le Dr. Friðriksson, est présenté au Comité. Le Comité prend note du renseignement donné par le Secrétaire Général à savoir que les statistiques sur l'effort de pêche pour 1954 ont été communiquées par six membres. On pense que l'on recevra des chiffres analogues au cours des années à venir. Une publication du Portugal comportant les statistiques sur "l'effort de pêche" pour 1953—1954 est distribuée. Il est admis que les nouvelles données sur "l'effort de pêche" et sur les captures correspondantes seront publiées dans un tableau remplaçant l'ancienne Tableau 7 du *Bulletin Statistique*; il comprendra en tête les termes de "l'effort de pêche" et les espèces des poissons, et il doit être divisé suivant les types des engins de pêche pour chaque secteur statistique. Afin de réduire les frais, la liste portant les noms de poisson et les cartes seront supprimées.

Le Comité discute ensuite d'une proposition faite par le Secrétaire Général. Un classeur serait établi, groupant les données statistiques de l'effort de pêche et du rendement depuis 1954 ou antérieurement suivant les données disponibles. Chaque carte devant donner les détails par pays, région de pêche, engin de pêche, effort de pêche, et capture de chaque espèce de poisson, un tel classeur demanderait 1500 cartes par an. A l'aide des cartes perforées, les informations statistiques de toute sorte seraient facilement accessibles. Le Dr. Kesteven (F.A.O.) offre de rassembler, sans frai pour le C.I.E.M., le matériel de 1954 suivant le principe adopté par F.A.O.; cette proposition est acceptée par le Comité qui remercie le Dr. Kesteven.

En se rapportant aux discussions de la réunion de 1954, il est convenu qu'à la prochaine réunion annuelle, toute contribution se rapportant notamment à l'usage des statistiques d'effort de pêche sera étudiée à la séance ordinaire du Comité.

Le Comité exprime sa gratitude au Secrétaire Général pour avoir fourni rapidement les dernières informations à la Commission Permanente de la Convention Internationale de la Pêche de 1946.

Le Comité Statistique appuie à l'unanimité la recommandation suivante du Comité des Mers Nordiques Proches:—

"Le Comité des Mers Nordiques Proches recommande qu'il soit demandé aux pays membres de fournir toutes leurs statistiques sur les prises du merlan (et sur "l'effort de pêche" si possible) capturé par quelque procédé que ce soit y compris la pêche industrielle. Ces informations seront envoyées au plus tard au mois de Juin 1956 au Secrétariat du C.I.E.M. pour y être polycopiées et distribuées avant la réunion du Conseil de 1956."

Le Dr. J. Lundbeck est réélu Président.

II. Recommandation.

Il est recommandé qu'une somme de 1500 Kr. soit prévue pour couvrir les frais des cartes perforées pour le classement des données statistiques relatives à l'effort de pêche et au rendement facilitant ainsi l'étude ultérieure de celles-ci.

2ÈME PARTIE

RAPPORT ADMINISTRATIF

REPORT

of

ADMINISTRATION FOR THE YEAR ENDING OCTOBER 31st 1955

I. General.

Composition of the International Council.

Delegates.

Finland have appointed Professor E. HALME, Directeur de l'Institut Scientifique des Pêches Maritimes, Helsingfors, as senior delegate instead of Professor, Dr. GUNNAR GRANQVIST, with Dr. I. HELA, Institut pour l'Exploration de la Mer, Helsingfors, as second delegate.

United Kingdom. Mr. A. J. AGLEN acted again this year as delegate for Scotland and as from 1. November 1955, Mr. R. S. WIMPENNY replaced Mr. WALL as delegate for England.

Composition of the Bureau.

The Bureau, elected at the Council Meeting 1955, consists of the following members:—Professor H. U. SVERDRUP, President, Dr. Å. VEDEL TÅNING, First Vice-President, Dr. J. FURNESTIN, Dr. E. LELOUP, and Mr. A. J. AGLEN, Vice-Presidents.

Committees and Editors.

At the 43rd Council Meeting, October 1955, various changes took place in the chairmanships. Dr. J. H. FRASER was nominated Editor of the *Fiches d'Identification du Zooplancton* with Dr. G. THORSON as Co-editor.

Meetings.

A meeting of the Bureau took place in Copenhagen on 23. May, and was attended by all members and the Chairman of the Consultative Committee.

A Sub-Committee meeting to "direct the preparation of final mean charts of surface temperature and salinities to be prepared by the Service Hydrographique" was held at the Central Office from 2.—5. September and was attended by Mr. J. R. LUMBY, England, Chairman, Dr. G. DIETRICH, Germany, and Professor P. GROEN, Holland.

A Sub-Committee meeting "for the revision of the present standard method of salinity determination" was held at Copenhagen from 21. to 23. October, and was attended by Mr. F. HERMANN, Denmark, Chairman, Dr. K. KALLE, Germany, Dr. F. KOCZY, Sweden, Mr. P. TCHERNIA, France, and Mr. W. D. MANIECE, England.

II. Central Office in Copenhagen.

Staff.

No change.

Publications.

	Issued Vols.	In preparation Vols.
Rapp. et Proc.-Verb.	137, 138, 139	140
Annales Biologiques .	10	11
Journal du Conseil . .	20, 2 & 3, 21, 1	21, 2
Zooplankton Sheets .	—	50—59
Bulletin Statistique . .	38 (for 1953)	39
Bulletin Hydrogr. . . .	for 1951	for 1952
Synoptic Charts	July 1954—June 1955	July 1955

Income and Expenditure Account for the Financial Year $^{1}/_{11}$ 1954—$^{31}/_{10}$ 1955.

EXPENDITURE

	D. kr.	D. kr.
I. Incidentals		
President	5,000.00	
Chairmen of Committees	19,074.82	24,074.82
II. Salaries		
General Secretary	17,000.00	
Administrative Department:—		
Assistant Secretary	12,461.63	
Part-Time Assistance	950.00	
Publication Department:—		
Assistant Secretary	12,461.63	
Dr. M. Rehder	1,255.36	
Assistant	9,324.32	
Statistical Department:—		
Assistant Secretary	12,461.63	
Hydrographical Department:—		
Hydrographer	20,327.69	
1st Assistant	11,199.23	
Clerical Assistant	9,006.00	
Part-Time Assistant	4,121.86	
Part-Time Assistant	3,144.02	113,713.37
III. Office Expenses		
Rent, Light, and Heating	7,277.50	
Stationary	4,365.69	
Postage, Telephone, and Telegrams	3,045.74	
Furniture and Fittings	2,480.75	
Insurance	1,030.75	
Upkeep	3,682.37	
Miscellaneous	6,195.33	28,078.13
IV. Travelling Expenses		11,616.35
V. Publications		
Printing	78,223.95	
Translation	710.37	
Distribution	683.62	
Editor of *Journal du Conseil*	3,785.55	
Editor Assistant	1,500.00	84,903.49
VI. Pensions		
Miss I. Hansted	6,870.48	
Miss E. Brønniche	9,804.00	
Miss M. Rehder	8,987.00	
Contribution, Pension Insurance	5,729.54	
Contribution, Pension Saving	1,656.22	33,047.24
Unexpended vote carried to Creditors		28,796.51
Excess of Income over Expenditure		12,705.46
		336,935.37

RECEIPTS

	D. kr.	D. kr.
I. Contributions		
Belgium	20,000.00	
Denmark	20,000.00	
Finland	10,000.00	
France	40,000.00	
German Federal Republic	40,000.00	
Iceland	20,000.00	
Ireland	15,000.00	
Netherlands	20,000.00	
Norway	20,000.00	
Portugal	15,000.00	
Spain	20,000.00	
Sweden	20,000.00	
United Kingdom	40,000.00	300,000.00
II. Interests		
on Bank Deposits	5,000.31	
on Investment Reserve Fund	4,513.50	
on Pension Fund	4,873.50	14,387.31
III. Sale of Publications		21,827.67
IV. Contribution from Woods Hole		720.39
		336,935.37

Balance Sheet October 31st 1955.

LIABILITIES	D. kr.	D. kr.
Capital Reserve		
Capital reserve fund ... 62,649.72		
Excess of income over expenditure 12,705.46	75,355.18	
Less difference in exchange	2,700.50	72,654.68
Pension Fund		106,564.16
Creditors		
Contributions for 1955/56 prepaid	171,667.00	
Chairmen Incidentals	1,435.70	
Unexpended Vote	28,796.51	201,899.21
		381,118.05

ASSETS	D. kr.	D. kr.
Cash at Sparekassen	221,170.17	
Cash at Postgiro	3,36	
Cash in hand	1,088.42	222,261.95
Bonds		
4½ % Danish State Bonds redeemable in 1997, nominal value kr. 208,600.00 at cost 171,098.00, market value 31/10 1955, 76 %		158,536.00
Debtor, offprints		320.10
		381,118.05

(sign.) Á. Fridriksson,
General Secretary

Else Hedegaard

I have compared the above Balance Sheet with the Books and Vouchers of the Council, and certify that it is in accordance therewith. I have verified the existence of the cash in hand and at bankers as well as of the Treasury Bonds.

Copenhagen, December 6th 1955.

(sign.) Karl Sørensen,
Statsautoriseret Revisor
(State-authorized Accountant)

We have scrutinized the foregoing Accounts and Balance Sheet and are satisfied that they are correct.

H. U. Sverdrup — Á. Vedel Tåning — E. Leloup
Cuesta Urcelay — G. Lienesch — Erkki Halme
B. Dinesen

REPORTS

of

AREA AND OTHER COMMITTEES

Distant Northern Seas Committee.

1954

By Å. Vedel Tåning

During 1954 the following research vessels of the member countries have operated in the distant northern seas (comprising the areas of the previous sub-committees for the North-Eastern Area and the North-Western Area):—

Belgium: none.
Denmark: "Dana", "Adolf Jensen".
England: "Ernest Holt".
Finland: none.
France: none (see below).
Germany: none (see below).
Iceland: "María Júlía".
Ireland: none.
Netherlands: none.
Norway: "G. O. Sars", "Johan Hjort", "Thor Iversen".
Scotland: "Scotia", "Explorer".

Moreover observations were collected by several chartered vessels, fishery inspection vessels, route vessels, etc., e. g.:— from France the frigate "Aventure" and the inspection vessel "Ailette", from Denmark the inspection vessel "Thetis", the commercial vessels, "Immanuel", "Gjógvarenni" and "Akranes", from Germany the inspection vessel "Meerkatze" and trawlers "Fr. Busse", "Hans Böckler" and "Bremen".

Observations and reports on the results are published in the *Bulletin Hydrographique, Annales Biologiques* and in other ICES publications and in national publications.

The administrative reports of the special committees on hydrography, plankton, cod, herring, salmon and trout, and shellfish give some information not included in this report.

Denmark

Faroe Waters and the Northern Atlantic
(Å. Vedel Tåning).

The research vessel "Dana" worked about 138 stations in the Faroe-Shetland Channel, around the Faroes, north of the Faroes and east of Iceland, in the area between Faroes and East Greenland and the Labrador Sea during June and the first week of July; on the return voyage from work in West Greenland waters (see below) the vessel operated a section from Cape Farewell to the English Channel.

Hydrographic observations and plankton samples were taken on most stations operated by the "Dana" (stramin-net, Hensen-net and plankton indicator were used). The standard section over the Faroe-Shetland Channel was operated as usual.

In the Faroe area material was obtained by "Dana" especially for quantitative studies on the occurrence of fry of cod and haddock; moreover trawling experiments with a 50′ otter-trawl were carried out in various localities. Material for age assessment of cod was, however, collected in the Faroe area mainly from commercial vessels and commercial catches. 4272 cod were measured, etc., and of these about 2050 otoliths were taken.

A total of 526 cod were tagged round the islands, especially from the M/C "Akranes", and the motor boat "Gjóvarenni".

During April and first part of May the Hensen-net was used for determination of the spawning areas of cod and haddock.

Herring research work was carried out during June particularly north of the Faroes and east of Iceland in collaboration with the Icelandic and the Norwegian research vessels (see the reports of the Herring Committee and the Hydrographical Committee); during this work zooplankton and phytoplankton samples were taken. During December 1953 and January 1954 experimental herring fishing (with floating trawl) was carried out north-east of the Faroes to West Norway; hydrographical and biological samples were obtained during these experiments.

The section from the Faroes to East Greenland along 62° N. Lat. was worked about 1. July, and hydrographic observations as well as zooplankton samples were taken. The similar observations were taken in September on the section from Cape Farewell to the English Channel.

West Greenland Waters (Paul M. Hansen).

Offshore Work:

The "Dana" operated in West Greenland waters from 7. July to 22. August. The "Adolf Jensen" worked occasionally on the banks April—August.

Hydrographic Observations were taken chiefly on eight sections off West Greenland on 72 stations, temperature measurements with the bathythermograph at 32 stations.

Plankton. Pelagic hauls with the 2 m. stramin-net were made at 63 stations, vertical hauls with the Hensen-net were carried out at 33 stations.

Productivity. Observations on productivity (by the C^{14} method) were taken on 26 stations.

Coastal Waters and Fjords:

The "Adolf Jensen" has carried out work during the whole year in the area between about 60° N. L. to about 66° N. L.

In Julianehåb district the "Immanuel" has continued the work that was started in 1953 up to the middle of August.

On the field laboratory in Godthåb part of the material collected by the "Adolf Jensen" has been examined.

Plankton. Pelagic hauls with 1 m. stramin-nets were taken on different stations in the fjords, the coastal waters and on the banks during the whole year.

In Godthåb and Julianehåb districts pelagic hauls were worked together with vertical hauls with the Hensen-net regularly on fixed stations.

Cod. See report from the Gadoid Fish Committee.

Herring. Fishing experiments with nets and seine have been carried out in Julianehåb district.

Samples of otoliths and scales together with measurements have been obtained. 256 herrings have been tagged with plastic tags fixed by spun nylon.

Salmon and Char. Electro fishing for salmon and char has been carried out in different rivers in southwest Greenland for stock analysis. Samples of about 250 salmon scales and 650 otoliths of char have been collected for age analysis and growth investigations.

137 small salmon and 807 char have been tagged with plastic tags and hydrostatic tags.

Greenland Halibut. Fishing experiments have been made in Godthåb and Lichtenau Fjords. A small number of Greenland halibut has been tagged.

Deep-Sea Prawns (*Pandalus borealis*). Fishing experiments with shrimp trawl and collecting of material for biological investigations have been continued.

Seals. Samples of seal teeth together with measurements have been collected from different places along the coast. About 1000 teeth of harp seals and 75 of grey seals have been determined for age.

Redfish. Measurements and weights have been obtained from catches by trawl, longlines and handlines.

England

(G. C. Trout).

During 1954 seven cruises to the Barents Sea were carried out by the "Ernest Holt". The first completed a winter survey of bottom temperatures, begun in the previous December. The area finally covered stretched from Bear Island Bank to Novaya Zemlya and south of 75° N. to the Murmansk and north Norwegian coasts.

The remaining six cruises were designed to cover the distribution of the cod on the Spitsbergen Bank. Incidental to this study, 3,000 Lea-tagged cod were released at widely scattered points from west Spitsbergen to Persey's Plateau in the east. This was the "Ernest Holt"'s part of a joint programme, planned with the "G. O. Sars" to release 5,000 tagged cod distributed as widely as possible over the Barents Sea cod population, in order to obtain mortality estimates.

The West Bear Island Hydrographic Section was carried out in March, June, October, and December, and plankton samples were taken simultaneously with hydrographic observations, whilst direct measurements of current flow were made during two cruises (October and December) using different methods.

Finland

(G. Granqvist).

No work at sea carried out in the area.

France

(Institut des Pêches).

Hydrographical observations were taken by the inspection vessel "Ailette" in the Norwegian Sea and by the frigate "Aventure" in Greenland waters.

Germany

(J. Lundbeck).

Market measurements on landings of the following species of fish were obtained from distant northern seas during 1954 by the "Institut für Seefischerei":—

Area	Species				
	Cod	Haddock	Coalfish	Trade Ling	Redfish
Barents Sea	2610	3267	—	—	—
Bear Island Deep .	848	—	—	—	265
Norwegian Coast ..	9475	4566	—	—	181
Faroes	69	—	—	1060	647
Iceland.....	9257	784	677	—	—
West Greenland...	328	—	—	—	—
Total	22587	8617	677	1060	1093
Comprising Otoliths	5944	2408	—	—	—
Individual weighings	5047	—	—	—	—
Morphological measurements ..	1550	—	—	—	—

Work at Sea. Occasional investigations have been made by scientific observes on two trips to Iceland, viz.: (1) Fishery protection vessel "Meerkatze", 25. March—9. May (1514 length and 60 morphological measurements on cod, additional observations on stomach contents, maturity, hydrography); (2) Commercial trawler "Fr. Busse", 8.—29. August (374 length measurements on cod).

The "Biologische Anstalt Helgoland" carried out the following sampling from commercial catches in the Bremerhaven fishmarket and on board trawlers operating in Icelandic waters:—

A. Fishmarket Sampling.

Measurements:	Iceland/Faroes	Greenland	NE.-Area	Total
Redfish	15,499	213	12,019	27,731
Saithe.....	16,028	—	7,008	23,036
Cod.....	207	330	—	537
Total	31,734	543	19,027	51,304
Otoliths:				
Redfish	1,740	107	1,568	3,415
Saithe.....	16,028	—	7,008	23,036
Total	17,768	107	8,576	26,451

B. Work at Sea.

1. 15. February to 8. March 1954, cruise by Dr. U. Schmidt on trawler "Hans Böckler" to SW. Iceland (Westmann Isles). On this cruise 3158 saithe were studied (2157 measurements, 1010 measurements, maturity determinations and otoliths secured.
2. 12. October to 3. November, cruise by Dr. U. Schmidt on trawler "Bremen" round Iceland. 1600 saithe were studied as to length, age and maturity.

Iceland

(Jón Jónsson).

Work at Sea. Four cruises were made with the research vessel "María Júlía" in Faxa Bay, where experimental trawling was carried out on two selected stations. During these cruises cod, haddock, and plaice were tagged and these and other species were otolithed and measured for stock analyses.

Plaice. 1404 plaice were otolithed and 2191 were tagged.

Other Fish. The following species were otolithed and/or measured:— whiting, dab, halibut, common skate, starry ray, coalfish, catfish, redfish, lumpsucker, lemon sole, and some few other species.

Ireland

(A. E. J. Went).

No work at sea carried out in the area.

Netherlands

(B. Havinga).

No work at sea carried out in the area.

Norway

(Finn Devold).

For information on gadoid fish, herring, hydrography and plankton, see the special committees. Of other research work carried out in the area the following should be mentioned:—

Catfish (*Anarrhichas minor*). Biological sampling and marking was carried out during two cruises with the "G. O. Sars" to northern Norway and the Barents Sea area: 3. March—13. April and 16. September—3. November. During the seasonal fishery for catfish off northern Norway in May—June a trip was made to the Bear Island Banks with "Thor Iversen" and to the North Cape Bank with a commercial fishing vessel, both for the purpose of biological sampling and marking. A short report on marking experiments on catfish has been prepared to *Annales Biologiques*, Vol. XI.

Redfish (*Sebastes marinus*). Some work has been carried out on the general problem of age determination of redfish by means of scales and otoliths. Sampling on a small scale was continued during the above-mentioned cruises to the Barents Sea. Our work on redfish will be extended in the coming years.

Scotland

(B. B. Rae).

During 1954 six cruises by the Scottish research vessel "Scotia" were planned in the old North-Western Area. Nothing was attempted in the old North-Eastern Area. The dates and itinerairies of these cruises were as follows:—

21. February—4. March:	Butt of Lewis, Faroe Bank, Faroe, Shetland.
10.—28. April:	Butt of Lewis, Faroe Bank, Enniberg Line, Faroe, Shetland.
12. May—19. June:	Butt of Lewis, Rockall Bank, Reykjanes, Denmark Strait, East Greenland, Faxa Bay, South Iceland, Faroe, Butt of Lewis.
5.—24. July:	North Orkney, Faroe, northwest Faroe, Butt of Lewis, Lousy Bank, Barra Head.
9.—29. October:	Butt of Lewis, Faroe Bank, Faroe, Shetland.
2.—15. December:	Butt of Lewis, Faroe Bank, Faroe, Shetland.

Bad weather prevailed throughout the year with the result that scientific work was often curtailed, and on the first and sixth cruises three or four stations only of the regular hydrographic lines were completed. Temperature and salinity observations were made at all stations on the cruises and investigations on the

oxygen, phosphate and chlorophyll content of the water were carried out at selected positions. An extensive report on water flow through the Faroe—Shetland Channel has been completed.

Plankton Collections were made on all cruises where weather conditions permitted. Particular attention was paid to searching for halibut eggs on the Iceland-Greenland grounds although with little success. The continuous plankton recorder was brought into use on the fourth cruise but once again conditions were unfavourable for its success.

Owing to weather conditions and to the priority of other claims of the work trawling at Faroe was confined to two hauls during the year. None was carried out at Iceland on this occasion.

Sampling of **haddock** and **chicken halibut** catches by commercial vessels at Faroe was continued on the Aberdeen Fish Market.

The results of these investigations will appear under their appropriate headings in *Annales Biologiques*, Vol. XI or in other publications.

Publications.

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Rae, B. B., & Wilson, E.: "Rare and exotic fishes recorded in Scotland during 1952." Scot. Nat., **65**, 114, 1953.

Near Northern Seas Committee.

1954

By Jöran Hult

Reports of the work carried out have been received from Belgium, Denmark, England, France, Germany, Netherlands, Norway, Scotland, and Sweden. Last year Dr. Lucas wrote in his introduction to the report for the North Sea Sub-Committee: "Research work in the North Sea continues to develop, there being few parts from which observations are not now being obtained with some regularity." However, as a consequence of the new committee system adopted in October 1954, the only more important fish species left to be dealt with here are the flatfish. The work on other important species has now to be included in the reports from the different committees on scientific subjects, for instance the Herring Committee, the Gadoid Fish Committee, etc. From this arises the question whether or not, as a result of the new committee system, the work of the Permanent Commission of the 1946 Convention for the Regulation of the Meshes of Fishing Nets and the Size Limits of Fish and this Commission's cooperation with the Council will become more difficult in the future as there will be no comprehensive report on the fish stocks within the area.

Belgium

(E. Leloup).

Hydrographical Observations were taken onboard the lightship "West-Hinder", the school-ship "Commandant Fourcault", and the fishery research vessel "Hinders". For details see the report of the Hydrographical Committee.

Work on the Fish Species. There is no work within the scope of this area committee, but for particulars of the biological work carried out see the reports of the Comparative Fishing, the Herring, and the Shellfish Committees.

Denmark

(E. Bertelsen).

Work at Sea.

North Sea. The R/V "Dana" worked in the North Sea from 7. May to 4. June and from 8. to 24. September.

The routine survey along the lines R and S of the North Sea hydrographical programme was made between 10. and 15. May (hydrography, stramin-net, Hensen-net hauls, etc.). Tagging of plaice, bottom sampling, and trawling was carried out in various localities in the central North Sea from about 54° to 57°30′ N. Lat.

The hydrography of the Bløden Ground and the occurrence of herring in this and surrounding areas was investigated by the "Dana" in May and September, and by "Jens Væver" in June, July, and August. The cruise in June was carried out in collaboration with the English research vessel "Platessa".

In the beginning of June "Jens Væver" carried out investigations on sole at the coast of Jutland and about 1. July the stock of young plaice in the Horns Reef area was examined.

Quantitative investigations on the young plaice in the Waddensea were carried out from motor boat in June, August, and October.

Kattegat and Skagerak. Two hydrographical-biological sections across the Skagerak were carried out by the "Dana" in the beginning of May.

The S/S "Biologen" worked in the Kattegat and Skagerak from 20. March to 25. November. Fishing with the 2 m. stramin-net and the Hensen-net together with hydrographical investigations were carried out during March, June, and November. The regular collections of plankton have been continued at Anholt Nord and Kattegat SW. lightvessels.

Quantitative and qualitative investigations of the fish stocks were carried out from the "Biologen" in the Limfjord by fishing with eel-tog and trawl during March, June, and September, and in the Kattegat-Skagerak, mainly with trawl, during June, August, October, and November, and with prawn-trawl in the Skagerak during June and November.

From the M/B "Havkatten" quantitative investigations of the 0-group, especially of plaice and flounder, on the coasts were carried out during July—September. These investigations were also carried out in the Laholm bay by permission of the Swedish government as in preceding years. The special investigations on the occurrence of the 0-group flatfish by day and night near the coast were continued.

From the M/B "Havkatten" and other boats investigations were carried out in fjords and bays where land-reclaiming has been proposed.

The bottom invertebrate fauna was investigated from the "Biologen" in the Limfjord in connexion with other investigations.

From the M/C "Jens Væver" investigations of a floating trawl was carried out during January in the Skagerak—Kattegat, and the sorting of fish at different mesh-sizes of the herring-sprat trawl was investigated in the same waters in May together with investigations of the fish caught for processing.

The transplantation of plaice from Nissum Broad to the Limfjord and Belt Sea was carried out from 31. March to 12. May. The work was delayed by late and insufficient immigration of the young fish to the Broad.

Analysis of the transplanted plaice were carried out as usual. The experiments with new tagging methods were continued.

Work on the Fish Species.

Plaice. The stock of young plaice in the Waddensea and in the Horns Reef area was studied as in previous years. Market measurements and age analyses of plaice from cutter landings were made at Esbjerg in May, June, August, and October. In May about 800 plaice were marked in the central North Sea.

Other Fish. During the cruises measurements and material for age determination of several species were secured.

Fish for Processing was also investigated in many samples analysed at the laboratory.

England

(R. S. Wimpenny).

Work at Sea.

Eighteen cruises by the steam trawler "Sir Lancelot" and nine of the motor trawler "Platessa" were devoted to work in the area of the Committee. Of these, five "Sir Lancelot" cruises and four of the "Platessa" were made in connexion with an appraisal of the spring production of plankton off the NE. coast of England. The "Sir Lancelot" was also responsible for the English part of the international plaice investigations along the Texel Line in January, June, and October, benthos cruises over the Dogger Bank and Southern Bight in the same months, five gear testing cruises between November and December, a plankton survey of the NE. coast in June and another over the East Anglian herring ground in October. The "Platessa" in addition undertook three mesh selectivity cruises in March and December, and one to the Dogger Bank in connexion with a benthos survey.

Work on the Fish Species.

General. As a result of population studies it was found that spatial differences in ratio of total catch to total effort made a 13% error in the grand ratio for plaice in the North Sea, and 40% for haddock when the data for 1947—52 were examined. This finding supports the plea for the other European countries fishing in the North Sea, and that do not yet do so, to adopt statistical rectangles. A method has been worked out for estimating fishing and natural mortality coefficients from a change either in abundance or in length composition after a period without fishing. This has been used in respect of changes in the plaice stocks during 1939—45 and confirms a natural mortality coefficient of probably less than 0·1. A by-product of this work is the suggestion that the Danish-fished stock of plaice, heavily exploited in 1939—45, may be more separate from the rest of the southern North Sea stock than was formerly thought.

Plaice. Surveys of the Southern Bight spawning ground revealed a high density of eggs, the area of whose distribution was, as usual, associated with high salinity water. Oxygen content of the water was measured but no substantial differences in saturation were found inside and outside the egg patch. The "hump backed" condition of larvae was investigated in the laboratory and found to be due to the stopping up of the channels by which the yolk products normally pass to the dorsal fin.

The regular young-plaice-trawl hauls were made in June off the Yorkshire coast and showed that the I-group (1953 brood) was well below the average this year.

Length measurements were made at Grimsby and Lowestoft, 40,000 at the former and 108,000 at the latter port. In addition to this, 1,800 otolith samples were taken at each port in order to construct an age/length key applicable to the length measurements.

Sole. The regular measurements of this species were continued at Lowestoft where 35,000 were dealt with, the samples being taken twice a week. At longer intervals smaller samples were collected for age determination by otolith reading. The effect on the fishery of a particularly rich year-class is now diminishing and it now appears that this species is likely to show considerable fluctuations in abundance due to the appearance from time to time of unusually successful broods.

France

(Institut des Pêches).

Travaux à la Mer.

Une campagne océanographique du navire "Président Théodore Tissier" a eu lieu en Mer du Nord et au large des Shetland en Août 1954. Des observations hydrologiques et des pêches de plancton ont été effectuées en Mer du Nord, sur le trajet de Boulogne à la région de Fladen. Une exploration des fonds de pêche aux accores du plateau continental entre les Iles Shetland et St. Kilda a été effectuée (étude de la faune et documentation en vue de l'établissement d'une carte des fonds); cette étude a été complétée par des observations hydrologiques et des pêches de plancton.

Des observations hydrologiques et planctoniques ont été effectuées dans la zone côtière de Boulogne.

Une sortie en mer à bord d'un chalutier a été effectuée dans la région d'Utsire au cours du mois de Novembre 1954, ainsi que plusieures sorties à bord des chalutiers pêchant le hareng dans le sud de la Mer du Nord (observations hydrologiques, faunistiques et planctonique; étude des conditions de pêche).

Germany

(A. Bückmann).

Work at Sea.

In addition to a number of small trips, the research cutter "Uthörn" of the "Biologische Anstalt Helgoland" made the following cruises in the area of the south-eastern North Sea (chiefly German Bight):—

27. April— 7. May: Plaice and other food fish. Bottom grab.
11. May —15. May: Hydrography and biology of the Weser estuary.
24. May — 5. June: Fry of summer-spawning food fish.
7. July —14. July: Fry of summer-spawning food fish.
25. Aug.— 5. Sept.: Plaice, dab, whiting, and other food fish. Bottom grab.
12. Nov.—20. Nov.: Dab and whiting.

Work on the Fish Species.

Plaice. During the cruises of the "Uthörn" ca. 10,000 plaice were examined for age, length, and sex in the inshore parts of the German Bight in April—May and August—September. In about 600 specimens the stomach content was investigated in comparison with the bottom fauna at the same station as represented in the bottom sampler catches.

Of other kinds of food fish 1400 specimens were measured during these cruises, age investigations were made on cod, turbot, and brill.

Sole. 161 soles caught during the cruises mentioned were investigated for age, length, and sex.

During the cruises in May—July the number of sole eggs to the square metre of sea surface was found to be equal to those of the years 1949—1952, and much superior to the numbers caught in previous years, viz.:—

1904—1930.....	10— 35	eggs per m.² in maximum
1949—1952.....	100—276	„ „ „ „ „
1954.....	100—204	„ „ „ „ „

Dab. Investigations concerning the biology of the dab in the North Sea were initiated at the "Institut für Fischereibiologie der Universität Hamburg." Dabs caught during the summer and autumn cruises of "Uthörn" in the inner parts of the German Bight and in the German shallows were investigated for length, age, and sex.

Moreover, the quantity of dabs caught by German shrimpers in German inshore waters were assessed, and measurements taken, at different places along the German North Sea coast, by the "Institut für Küsten- und Binnenfischerei", Hamburg.

Work on Bottom Fauna.

As in previous years the quantity and composition of the invertebrate bottom fauna was investigated at the same time with the stomach contents of the plaice caught at the same station in spring and late summer 1954. Altogether, about 100 bottom samples of the van Veen grab 0·1 m.² were investigated.

Netherlands

(L. K. Boerema).

From the 31 cruises the "Antoni van Leeuwenhoek" made in 1954, 10 were devoted to routine trawling for plaice in the Dutch coastal area.

Work on the Fish Species.

General. All fish species caught in the routine trawling have been recorded, and the commercial species measured.

Plaice. No time was available this year for the programme of investigations on plaice eggs and larvae.

The routine trawling along three lines from the Dutch coast seawards in co-operation with the Lowestoft Laboratory, has been carried out in April, July, and October. These investigations gave information on the density, distribution, and growth of the plaice in the area between the Dutch coast and 3° E.

Sole. In order to get information on density, age composition, and growth in the Dutch coastal area all soles caught in the routine trawling have been measured, sexed, and otolithed.

Norway.

See the different Committees on Scientific Subjects.

Scotland

(H. Wood).

During the year the Department's research vessels "Explorer", "Clupea", "Kathleen", and the experimental vessel "Silver Scout" (on loan from the Herring Industry Board), worked continuously within the boundaries defining the Near Northern Seas. In addition, "Scotia" made three cruises within the area and during four cruises to Faroe, one to Iceland and East Greenland, and one to the outer oceanic banks, she made series of hydrographic and plankton observations up to and beyond the western limits of the area.

The usual extensive programme of hydrographic and plankton observations was carried through, and during the year an extensive report on the analysis of water-flow through the Faroe-Shetland Channel over the period 1927—52 was completed and is now in press. Plankton surveys had amongst their objectives the distribution of larval and early post-larval stages of haddock and herring, and environmental changes as revealed by the distribution of exotic and indicator species.

As part of the comprehensive investigation of the Northern North Sea, chemical and plankton sampling was extended in 1954 in support of the studies of basic production within the area. In addition, five hydrographic and plankton surveys were made in association with the Edinburgh Laboratory of the Scottish Marine Biological Association with relation to the distribution of the herring shoals.

Sampling of the haddock stocks was maintained by the research vessels and by sampling of commercial catches landed at the Aberdeen fish market. Studies of the biology and bionomics of the whiting, which is increasing in importance in the Scottish fisheries, are now under review and are being extended.

Regular watch is being maintained on the observance of the new mesh regulations.

During the year "Explorer" made four surveys of plaice populations along the Scottish east and north-east coasts. In this work "Explorer" was assisted by "Kathleen", which operated in the shallower zones. A total of 4,209 plaice was tagged on the following grounds:— Clyde estuary 554; the Scottish north coast 255; Sinclair Bay 200; the Moray Firth 1600; Aberdeen Bay 600; St. Andrews Bay 800; Largo Bay (Firth of Forth) 200. In association with plaice growth and population studies, fauna surveys were made at frequent intervals within St. Andrews Bay and Aberdeen Bay. Underwater photography is playing an increasingly greater part in this work, and amongst other things it enables assessment to be made of the efficiency of Agassiz and other dredge equipments used in the sampling of the epifauna.

A comprehensive survey of lobster and crab populations is developing satisfactorily. Tagging experiments of lobsters combined with many size measurements produced data, which have been useful in determination of fishing mortalities.

Experiments, using frogman techniques, have been made with models of fishing gears and have produced results, which so far are in good agreement with those obtained with full-size gear. With the help of an underwater ciné camera, further studies have been made of plaice behaviour and some useful illustrations have been obtained of the behaviour of a shoal of sandeels and of individual specimens of haddock, gurnard, dogfish, and ray being overtaken by a seine net.

Help has been given in association with the White Fish Authority in investigating the possibilities of developing a fishery for porbeagle shark.

Sweden

(J. Hult).

Biology. Investigations were carried out on the consequences of the opening, during the winter season, of certain coastal waters on the west coast of Sweden for the herring and sprat trawl fisheries and their influence on the composition of the fish stock and catches of other species in these waters.

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Baltic-Belt Seas Committee.

1954

By Aa. J. C. Jensen

The hydrographical environment of the commercial species has been investigated from the research vessels of all of the participating countries (see Hydrographical Committee), and the regular observations from lightvessels have been continued. The transparency of the water in the central and northern Baltic has been measured by Finland. The plankton has been investigated from the research vessels, and from lightvessels by Denmark and Germany. The Danish determinations of the production by aid of the C^{14} method at "Halsskov Rev" lightvessel has been continued and has been started in coastal waters. The quantitative bottom samplers have been used from Denmark, mainly for investigations in areas for which embankments have been proposed and for investigation of pollution.

In connexion with, or as the main object for the plankton investigations the distribution and quantity of eggs and larvae of commercial species of fish have been studied; a special investigation of the mackerel eggs and larvae started by Dr. Kändler has been continued.

The most important work has been the continuation of previous years' quantitative and qualitative investigations of the commercial fish stocks in order to follow their fluctuations, and especially the effects on the fishery. From Denmark quantitative fishing with the standard gears (the trawl of the S/S "Biologen" and the Johansen young-plaice-trawl) have been carried out, and from Sweden quantitative hauls from the M/S "Eystrasalt" have been carried out in the Åland Sea. The regular work for investigations on the fluctuations of the commercial stocks also comprises analyses at the laboratories of Denmark and Germany of samples of plaice and cod.

Commercial catches of herring have been analysed in Denmark, Germany, and Sweden, and tagging experiments have also been carried out (see Herring Committee) by Sweden.

In Sweden eels have been tagged at the southern coast of Scania. In Denmark commercial catches have been examined for length and age. The investigation of the salmon in the Baltic has been continued (see Salmon and Trout Committee).

The catches of the fishery for industrial processing and the selection of small fish at different mesh-sizes have been studied by Denmark partly by samples investigated at the harbours and at the laboratory, and partly by fishing from the R/V "Jens Væver".

The Swedish R/V "Eystrasalt" has fished with pelagic trawls in the northern Baltic in order to locate trawling grounds for this fishery.

The influence of sewage has been studied in Denmark and Germany.

Denmark

(Aa. J. C. Jensen).

Hydrography.

From the S/S "Biologen" hydrographic observations were taken at fixed stations through the Great Belt but also at other places in the area especially in connexion with the 2 m. stramin-net plankton stations and in the southern Little Belt and the westernmost Baltic.

Plankton.

The 2 m. stramin-net was used from the S/S "Biologen" during March, May, and June especially for fish larvae; vertical hauls with the Hensen-net were made at the stramin-net stations but also round Bornholm in August—September. The production of plankton was determined at "Halsskov Rev" lightvessel by the C^{14} method, and in coastal waters.

Benthos.

The invertebrate bottom fauna has been investigated with quantitative bottom samples at some places where pollution was caused by sewage from towns and factories, and in areas where embankment has been proposed.

The Fish.

Quantitative trawling for commercial bottom fish was carried out from May to December from S/S "Biologen", with length measurements and age analyses. The distribution of the 0- and I-group of flatfish at the coasts was investigated with the Johansen young-plaice-trawl from the motorboat "Havkatten", partly also from the motorboat of S/S "Biologen" and by push net and beach seine.

Analysis of samples from the commercial fishery for plaice, cod, herring and eel and of fish for industrial processing were carried out at the laboratory.

Marking of plaice has been carried out in connexion with the transplantations. A small marking experiment with mackerel was carried out in the Sound.

Investigations of the fishing of various trawls and the selection of fish by different mesh-sizes have been carried out from the research vessel "Jens Væver".

Finland

(G. Granqvist).

Hydrography.

See the report of the Hydrographical Committee.

Biology.

1. Dr. E. Palmén at Zoological Station Tvärminne has studied the ecology of *Aurelia aurita*, and of *Chironomus* species occurring in this region.

2. K. Purasjoki has continued his investigations on the Baltic plankton. About 300 samples from the years 1950—53 have been studied.

3. Prof. Ralf Smith, California, has studied the osmoregulation of *Nereis diversicolor* at Tvärminne Zoological Station.

4. Dr. H. Luther has continued his observations on the water plants of the Archipelago of Nauvo-Hiittinen.

5. L. Koli has studied the ecology of gastropods in the coast area of Helsinki.

Germany

(R. Kändler).

Hydrography.

See the report of the Hydrographical Committee.

Plankton.

See the report of the Plankton Committee.

Benthos and Microbiology.

During the cruises in the Kiel Bay, further samples of bottom fauna were collected to complete the previous studies on these forms. The influence of sewage on the benthos in the coastal waters was studied. In this connexion, the microfauna of the Schlei (bacteria, Ciliata, Phycomycetes) were studied.

The Fish.

Eggs and Larvae. The spawning survey was continued by regular plankton sampling from the lightship "Fehmarnbelt".

Due to repairs on the R/V "Südfall", investigations on fish larvae could not be taken up before May 1954. Hauls with the 1 m. ring-trawl for herring larvae were made during May—July in the Schlei which is an important breeding ground for spring spawners.

On the recommendation of the Transition Area Sub-Committee that the spawning places of the mackerel should be investigated through international co-operation, investigations were carried out in the Kiel Bay, Great Belt, and Little Belt, from 15. to 18. June 1954, on R/V "Südfall". Vertical hauls with the Hensen egg-net, and horizontal hauls with the Petersen young-fish-trawl were taken at 23 stations, to study especially the fish larvae, decapod larvae, and Medusae. The aim of these investigations was to find out from the distribution and frequency of pelagic forms and from the hydrographical conditions the factors determining the movement of spawning mackerel from the Kattegat into the Kiel Bay.

Some fish larvae hauls were taken during the return cruise from Öland in July 1954, especially at the deeper levels.

Mackerel. Analyses of the fat content of different parts of the body, and its fluctuation during the year, were made.

Sweden

(G. Otterlind).

The R/V "Eystrasalt" was engaged in the Baltic area from June to December and the "Skagerak" made two hydrographical cruises there in May and in July—August.

Hydrography.

See the report of the Hydrographical Committee.

Plankton.

Plankton samples were collected with the Hensen-net in connexion with the herring investigations in the Bothnian Sea. Attention was also paid to the fungus disease of *Eurytemora hirundoides* which was observed especially in August at the Swedish coast of the Bothnian Sea.

Biology.

Cod. (See the Gadoid Fish Committee).

Herring. (See the Herring Committee).

Eel. A tagging experiment was started in September—November at Trelleborg, southern Baltic. 1300 eels were tagged with silver plates stamped SV and a number.

Salmon. (See Salmon and Trout Committee).

Aids to Fishing.

In October, November, and in the beginning of December the R/V "Eystrasalt" was engaged in fishing experiments with pelagic trawls, in locating trawl bottoms, etc., in the northern Baltic.

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Comité Atlantique.

1954

Par Jean Furnestin

Des rapports sur les travaux effectués dans le secteur du Comité Atlantique ont été reçus des pays suivants:— Danemark, Ecosse, Espagne, Irlande, Portugal, France et Union Française.

Danemark

(Å. Vedel Tåning).

During late August and the first days in September the R/V "Dana" operated a section from Cape Farewell (South Greenland) to about 50° N. Lat., 30° W. Long. and from here to the English Channel. Hydrography and sampling of zoo- and phytoplankton were carried out; plankton production was studied by the C^{14} method.

Ecosse

(J. H. Fraser).

Scottish work in the Atlantic area in 1954 was limited to the August cruise of F. R. S. "Scotia" in the area west of Ireland. A series of hydrographic and plankton observations were made from off the mouth of the River Shannon across Porcupine Bank to 58°28′ N., 18°00′ W. and from thence to Rockall Bank and along the approximate latitude of 57° N. to the west Scottish coast.

Great lining and trawling were carried out along the west Irish coast, on Porcupine Bank, on Rockall Bank and west of Barra Head at the southern tip of the Hebrides.

Espagne

(F. de P. Navarro).

Hydrologie.

En Août—Septembre, le navire de recherches "Xauen" a fait en Galice 18 sections hydrologiques radiales entre la côte et l'aplomb de l'isobathe de 600 m. Les observations à chaque station (sondages, températures, salinité, oxygène et phosphates entre 0 et 600 m.) ont été complétées par des pêches de plancton en surface.

En Août, 8 stations ont été faites sur le trajet Cadix—Vigo comportant les observations hydrologiques et les pêches planctoniques habituelles.

Les laboratoires océanographiques de Saint-Sébastian, Santander et Vigo ont poursuivi régulièrement les recherches hydrologiques à portée locale.

De nombreuses sorties périodiques ont été faites dans la ria de Vigo par le bateau "Lampadena" du "Laboratorio de Investigaciónes Pesqueras". La température des eaux a été mesurée à l'aide d'une thermosonde "Thermistor". Des essais ont été faits pour évaluer par filtration la matière organique en suspension.

Plancton.

Voir le Comité du Plancton.

Bathymétrie et Sédiments.

Au cours de la campagne du "Xauen" près de 200 échantillons de fond ont été recueillis. L'échantillonage s'est poursuivi aussi dans les diverses rias de Vigo.

Biologie.

Les observations sur les clupéidés, les engraulidés, les scombridés et thonidés, les gadidés, les mollusques et les crustacés sont citées dans d'autres rapports.

Les recherches sur d'autres poissons ont été poursuivies aux divers laboratoires. Les études sur le chinchard, espèce à très grand intérêt industriel, ont été entreprises au "Laboratorio de Investigaciónes Pesqueras" de Vigo. La prospection des champs d'algues industrielles a été poursuivie sur les côtes de Santander et de Galice.

France et Union Française

(Institut des Pêches).

I. Travaux à la Mer.

Au cours de l'année 1954, le navire "Président Théodore Tissier" a travaillé dans les régions suivantes:—

en Mai—Juin, des Açores à Vigo, puis entre le Cap Finisterre et 17° de longitude ouest, effectuant 47 stations hydrologiques comportant 240 prises d'eau et de température;
en Juin—Juillet dans la partie nord du Golfe de Gascogne où il a procédé à 83 stations comprenant 262 prises d'échantillons d'eau de mer et observations de température, ainsi que 54 prises de sédiment;
en Août au banc Porcupine et à l'entrée occidentale de la Manche où 58 stations, 133 prises d'échantillons d'eau de mer, et de température, 24 récoltes de sédiment ont été faites.

De nombreuses observations ultra-sonores ont été également effectuées, ainsi que des lancers de bouteilles dérivantes et des pêches régulières de plancton.

Des sorties ont eu lieu sur d'autres bâtiments pour l'étude des conditions en zone côtière:— en Septembre entre La Rochelle et l'Ile d'Yeu, dans la région de Saint-Jean-de-Luz en Avril, Août et Septembre.

Des observations régulières ont été faites par la frégate météorologique stationnant au point K.

II. Biologie.

Clupéidés.

Clupea pilchardus: des observations biométriques régulières ont été faites à Saint-Jean-de-Luz et à La Rochelle pendant toute la durée de la saison de pêche ainsi qu'à Belle-Ile et à Concarneau en Juin—Juillet. 14,000 marquages ont été effectués. Une expérience de détection a été entreprise en Octobre aux Sables d'Olonne.

Scombridés.

Germo alalunga: le retard constaté dans l'apparition du germon au large du Cap Finisterre en Juin a été étudié en relation avec l'arrivée tardive des eaux transgressives. Quelques mensurations ont été faites à Saint-Jean-de-Luz.

Thunnus thynnus: un lot de 200 thons rouges a été mesuré en Juin et un essai de pêche aux lignes électriques entrepris à Saint-Jean-de-Luz.

Sparidés.

Pagellus centrodontus: une étude de la croissance du pagel a été faite au laboratoire de La Rochelle.

Crustacés.

Crangon vulgaris: les observations commencées en 1953 (croissance) ont été poursuivies.

Mollusques.

Pecten maximus: le stock en rade de Brest a été examiné et des marquages ont été effectués.

Huîtres: les émissions de larves ont été suivies dans les régions d'Auray, La Tremblade et Arcachon. Ces observations ont été accompagnées de l'étude des conditions hydrologiques et de recherches sur les collecteurs et les engrais. L'étude des sols des claires et le verdissement a été entreprise à La Rochelle et dans le Bassin d'Arcachon.

Mytilus edulis: une étude sur la croissance de la moule est en cours au laboratoire de La Rochelle.

Chalutage Comparé.

Une expérience comparative entre des chaluts en sisal et en nylon a été faite à Concarneau.

III. Sur les côtes du Maroc et d'Afrique Noire, du Cap Blanc à l'Equateur, continuation des recherches sur l'hydrologie (températures et salinités en surface et à diverses profondeurs) et l'ichthyologie locale.

Irlande

(A. E. J. Went).

During the year, Miss H. Elkin, M. Sc., carried out an investigation into the age, growth, sexual development and food of whiting taken on the east and west coasts of Ireland by commercial vessels and her results have been incorporated in a paper accepted for publication by the Royal Dublin Society.

Dr. F. A. Gibson continued his work on the escallops (*P. maximus*) and Mr. Toner continued his observations on the oyster stocks of a small area of Clew Bay (see report of Shellfish Committee). Work done by this country on salmon has been the subject of a report to the Salmon and Trout Committee.

Portugal

(A. M. Ramalho et F. Frade).

Trachurus trachurus. Etude de la croissance de cette espèce pendant la première année de sa vie. (35 échantillons étudiés du 12 Juillet au 28 Décembre).

Des recherches concernant les poissons et la pêche indigène dans les eaux équatoriales des îles de S. Thomé et du Prince ont été amorcées par la Mission Scientifique de S. Thomé, vers la fin de 1954.

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Comparative Fishing Committee.

1954

By C. E. Lucas

One result of the Special Scientific Meeting concerning "The comparative efficiency of fishing craft, their gear and modification of gear" in 1948 (Rapp. et Proc.-Verb., **125**, 1949) was that the importance of such matters in the Council's work was acknowledged by setting up a Comparative Fishing Sub-Committee under the then Southern North Sea Committee. This in due course became a sub-committee of the combined North Sea Committee. By this means, the attention of the Council was drawn through the North Sea Committee to important investigations proceeding in several countries—ranging from measurement of fishing gear components in action to underwater photography of fishing gear and the reactions of fish to it. Particularly important contributions were made from time to time concerning mesh selection, which were of value in enabling the Council, through its Liaison Committee, to advise the Permanent Commission of the Fisheries Convention, 1946.

The growing realisation of the significance of such work led the Council, at its meeting in 1954, to decide that the Sub-Committee should be raised to the status of a full Committee, with its own Chairman who should be a member of the Liaison Committee. This therefore is the first Administrative Report of a new Committee of the Council, and it is gratifying to be able to record formally in this way something more of the work now proceeding in various countries.

It would, in fact, be difficult to exaggerate the importance of comparative fishing investigations, partly because of their direct practical relevance to the fishing industry and partly because of their significance in securing a sufficient understanding of the fish populations which are among the main objects of the Council's investigations. Success in the last lies at the foundation of stock assessment and prediction, and it is scarcely necessary to emphasize in this the importance of the inter-relationship between the fish and the gear used to catch or sample them, a point which the Council has always had clearly in mind. Also, as the Special Scientific Meeting in 1948 made quite clear, the fishing craft itself is an essential consideration when gear as such is being discussed. One of the most important requirements today is an assessment for the various commercial fish of the relationship between catch and fishing effort, and it is for this reason that the Consultative Committee specifically asked the new Comparative Fishing Committee to consider this relationship at an early date, so that a useful comparison can be made between the various units of fishing effort and suitable standards established.

Reports have been received from seven countries concerning their work during 1954. Whilst the remaining countries are not in a position to report at this moment, it is evident that work is proceeding in several and reports can be anticipated from them in the future.

Belgium

(Ch. Gilis).

At regular intervals, experimental fishing with trawl-nets of different widths of cod-end meshes (70—75—80 mm.) was carried out on different points in the southernmost area of the North Sea. The nets were used alternately.

Manipulation of the Material.

1. Complete inventory of the catch (fish, shellfish, and invertebrae).
2. Recording the number and lengths of all fish—also the total weight of each species of fish.

The main object of these experiments is to study the saving effect of these nets as regards the flatfish and in particular the sole.

Sole Fishery.

In the sole investigations experiments were made with:—

1. a trawl-net with cod-end meshes of 80 mm. and a cover-net of 70 mm. meshes, and
2. a trawl-net with cod-end meshes of 70 mm. and a trawl-net with cod-end meshes of 80 mm. Both nets were used alternately and without covers.

England and Wales

(A. R. Margetts).

Mesh experiments were carried out to find out the difference, if any, of selection between cotton and sisal trawl cod-ends. In the first experiments "Platessa" used cod-ends of mesh-size about 70 mm. on the gauge, made of double sisal and double cotton twines, the two sorts of twine being of approximately the same thickness. The covered cod-end technique was used and whiting was chosen as the species of fish for the experiment. Although the 50% selection points seemed to vary either with fishing ground or with time, those for the cotton cod-end were always

higher than those for the sisal cod-end in comparable hauls. The difference was about 2—3 cm. length of whiting. The selectivity of the sisal was sharper than that of the cotton. Further experiments from "Sir Lancelot" using thinner cotton and comparing the selection of this both double braided and single braided with double sisal were curtailed by bad weather, but a series of comparable hauls indicated, at first inspection, that the three cod-ends, all of approximately the same mesh-size, were all selecting the same size of whiting. If this result is correct, it indicates that towing speed and power may influence trawl-mesh selection.

Trials of luminous fish hooks were carried out from a commercial longline vessel on a normal trip. These showed that the luminousity of the hooks did not attract fish to be caught; unbaited the luminous hooks caught nothing, and when baited they were only as efficient as the simple baited hooks.

By analysis of records of a great many commercial trawler landings, the proportionality between fishing power and gross tonnage of medium and large steam trawlers was confirmed. It was found that, ton for ton, the fishing power of the smaller English trawlers (drifter-trawlers of length about 90 ft.) was rather more than that of the medium trawlers, and also that the fishing power, again ton for ton, of motor trawlers was about 1·4 times that of medium steam trawlers. The fishing power of motor trawlers was related equally well to both gross tonnage and B.H.P. Gross tonnage is therefore again indicated as being a fairly reliable simple index of fishing power for use in standardization of commercial statistics. The same investigation also provided an indication of the relative reliability of the values of "hours fishing" and "days' absence" as measures of fishing time by Arctic trawlers, it being well known that the figures for days' absence, and hence the apparent fish stock densities derived from them, are affected by such factors as steaming time, weather, and fish abundance; the catch per day's absence ceased to be proportional to fish density when the catching rate rose above 50 cwt. per day.

Trials designed to improve the technique of herring trawling using both the bottom herring trawl and the single-ship Larsson mid-water herring trawl were carried out from "Platessa" and "Sir Lancelot". For the mid-water trawl it was found that compared with the original design, all parts of the net and gear had to be strengthened and strains within the netting distributed more evenly so that the apparently necessary high towing speed could be successfully achieved. Two cruises by "Sir Lancelot" were devoted to attempting to find a technique whereby herring or whiting could be trawled separately with the bottom herring trawl when both species occurred on the same ground. Many variations of gear adjustment and trawling speed were tried. The aim was not achieved, but it was thought that further investigation was desirable before deciding whether such a technique of trawling was or was not possible.

Trials with a lampara net for catching pilchards were started.

In the distant-water fishery "Ernest Holt" used, on occasion, an Icelandic type of trawl for alternatively mid-water or bottom fishing, and also a German type of wingless bottom trawl, but the trials were too inadequate for conclusions to be drawn about the catching capabilities of these gears.

France

(Institut des Pêches).

Au cours de l'année 1954 des essais comparatifs d'un chalut en sisal et d'un chalut en nylon ont été effectués à bord d'un chalutier de Concarneau.

Cette expérience a montré l'influence du textile sur la qualité des captures. A mailles égales le chalut en nylon s'est révélé bien moins destructeur des poissons de petite taille que le chalut en sisal. Les études doivent être continuées.

A la fin du mois de Décembre des expériences ont été entreprises en Manche Orientale en vue de comparer les captures faites avec des chaluts à petites mailles à celles effectuées avec des chaluts à grandes mailles.

Ces essais ont été effectués sans "covered end" mais doivent être poursuivis avec le dispositif approprié.

Germany

(A. von Brandt).

Trawling Gear Investigations.

The measurements of herring trawling gear dealing with the design of the gear, in particular the opening-height, were continued. Thus the following average values for the height of the head line and kites above the bottom were found with the nets of German trawlers:—

Head line	3·5—4·0 m.
First kite	7·0—8·5 m.
Second kite	11·5—13·5 m.

The measurements were carried out with special equipment. Echograms were obtained at the same time.

In June 1954, experimental fishing was carried out in co-operation with the Union des Syndicats Français des Fabricants de Conserves de Poissons on the usefulness of the electrical tuna line developed in Germany by Dr. Kreutzer. The opinion of the fishermen was confirmed, that the electrical fishing method prevents an escape of the tuna, so that the output could be increased by 100%.

Experiments made on the technique of a reproducible determination of the mesh-size of nets suggested that it would be most appropriate to carry out the measurement by means of a pressure gauge. The measurements showed great deviations, depending on the net material.

The pelagic trawling gear, designed by K. H. Larsson of Stockholm, was tested during two voyages.

Under certain conditions it was possible to achieve satisfactory herring catches (Skagen). The behaviour of the net under various conditions was determined, e. g., length of the warp, adjustment of the otter boards, number of floats, towing speed, etc.

Drift-Net Investigations.

The efficiency of herring drift-nets made of perlon instead of cotton was tested. In the North Sea the Scottish nets (rope below the nets) yielded greater outputs up to more than 40%. With the "Sinknetz" (rope above the nets) it was found that the nets should be hardened so as to hang in an efficient position in the water. Then they also took at least 20% more. Similar results were obtained with herring drift-nets in the Baltic fisheries.

Netherlands

(L. K. Boerema).

The research vessel "Antoni van Leeuwenhoek" made 31 cruises in the course of 1954. Among these, 14 were concerned with mesh experiments.

The mesh selection of trawls made from two different types of twines had been studied by means of the covered cod-end method. It was shown that the type of twine did affect the mesh selection. The "lighter" trawl released relatively larger fish; the difference was greater in roundfish than in flatfish.

Further investigations have been carried out on the width and height of the mouth of different trawl-nets and on the strains in the warps and in the legs.

Norway

(G. Sætersdal).

Trawl experiments with two different mesh-sizes, 10 cm. and 13 cm., were carried out in May 1954 in the Bear Island area by the vessels "Thor Iversen" and "Peder Rönnestad" belonging to the Fisheries Directorate, Bergen. Two types of trawl were used: one type constructed of manila twine and the other of cotton with a cod-end of hemp. It is hoped that the results will be described at the next meeting of the Comparative Fishing Committee.

Scotland

(B. B. Parrish).

Items of gear research carried out in Scotland during 1954 were as follows:—

1. Experiments to determine the effects of towing speed and haul duration on the trawl catch.
2. Mesh-selection experiments.
3. Studies of the action of the seine-net.
4. Trials with pelagic trawls in herring fishing in different areas and seasons.
5. Observations on model trawls to determine their dimensions and behaviour during towing operations.
6. Comparative efficiency of different types of lobster pot.
7. Preliminary electric fishing experiments.
8. Continuation of echo-meter investigations.

These investigations formed part of the laboratory's long-term studies of the behaviour and performance of commercial fishing gear, and were conducted on North Sea and west coast grounds from the research vessels "Scotia", "Explorer", "Kathleen", and "Clupea", and the Herring Industry Board's search vessel "Silver Scout".

Members of the laboratory's staff also undertook "frogman" diving trials during the year, and this technique was used in observing the performance of model trawls. An underwater diver's "sledge", for use in observing the behaviour of fish on the approach to the trawl ground-rope, was designed and will be employed in gear experiments in 1955.

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Gadoid Fish Committee.

1954

By G. Rollefsen

The following countries, Denmark, France, Germany, Iceland, Norway, Scotland, and Sweden report to have carried out investigations coming under the purview of this committee during 1954. The reports from Germany and Iceland can be found in the contributions to the *Annales Biologiques*, Vol. XI.

Denmark

(P. M. Hansen).

Work on the Fish Species.

Cod. W. Greenland Waters (P. M. Hansen)

Offshore Work. Pelagic hauls with a 2 m. stramin-net were made at 63 stations. 3088 otoliths of cod for age determinations and growth studies taken by handline and longline were collected on 12 different stations on the offshore banks by the "Dana" and the "Adolf Jensen".

2004 cod were tagged on the offshore banks. Analyses of stomach contents were carried out.

Coastal Waters and Fjords. Cod eggs and larvae were fished for with a 1 m. stramin-net.

Fishing experiments with beach-seine and shrimp-trawl for small cod were carried out at different localities along the coast.

About 2762 otoliths have been collected partly from catches from the "Adolf Jensen" partly from the Greenlanders' catches at the different fishery stations along the coast.

A total of 1798 cod have been tagged in coastal waters and in the fjords between about 60° to 65° NL.

Baltic-Belt Seas (J. Knudsen). During April and May hauls with the 2 m. ring-trawl were carried out from S/S "Biologen" in order to investigate the number of larvae. Fishing with the cod trawl was carried out at 126 stations in the area, and length was measured on all the cod obtained (about 5000). Otoliths were taken from about 2000 cod and a smaller number was examined for sex and stomach contents.

Whiting. North Sea (E. Bertelsen).

Material for stock analysis were collected on the cruises in the North Sea and from market measurements of whiting from trawl catches in the Bløden Ground area landed in Esbjerg.

England

See the report of the Distant Northern Seas Committee.

France

(Institut des Pêches).

Morue.

Des observations ont été faites sur la morue du Grand Banc, du Golfe du Saint Laurent et du Banquereau au cours de la campagne du "Président Théodore Tissier", à Terre-Neuve en Mars—Mai 1954 (mensurations, relation taille-poids, prélèvement de 2,500 otolithes).

Merlu.

Des observations ont été commencées sur le merlu de la région d'Utsire (mensurations, relation taille-poids).

Germany

(A. Bückmann).

Cod (R. Kändler).

Commercial catches were studied for size and age composition. Investigations on the changes in the relative weight and fat content of the liver were carried out during the year.

Whiting.

Investigations concerning the biology of the whiting in the North Sea were initiated at the "Institut für Fischereibiologie der Universität Hamburg". Onboard herring trawlers and cutters fishing for oil herring as well as during the cruises of "Uthörn" the catches of whiting were investigated. Measurements and age determinations (about 4000) were made.

Moreover, the quantity of whitings caught by German cutters during the oil herring fishery was investigated, and measurements taken by the "Institut für Küsten- und Binnenfischerei", Hamburg. In addition, sex and (partly) maturity were assessed.

Saithe.

In market investigations at Bremerhaven, 4750 saithe were measured and investigated for age. Along with these saithe, 1175 specimens of other kinds were measured.

Iceland

(Jón Jónsson).

Cod.

For stock analysis 13,645 otoliths were collected and about 30,000 length measurements were made. 1641 cod were tagged with three kinds of tag. In West Greenland waters 837 otoliths of trawler-caught cod were collected for age determination.

Haddock.

2159 haddock were otolithed, 19,714 measured, and 1600 were tagged.

Norway

(G. Rollefsen).

Work at Sea.

The research vessel "G. O. Sars" was used in the cod-fish investigations in northern waters on the following two cruises: 1. March to 12. April and 16. September to 3. November. Two short trips were made with the vessel "Thor Iversen" belonging to the Fisheries Directorate, Bergen: one in August to W. Spitsbergen to study the appearance of the cod on the banks there and one in October to the Goose Bank in the eastern Barents Sea for the purpose of marking haddock in this area. On an autumn cruise with the R/V "Johan Hjort" to northern Norway the investigations of the "baby-groups" of cod, haddock, and saithe were continued. In March "Johan Hjort" was used for cod marking in Lofoten. In August saithe marking was carried out from "Johan Hjort" off Finmarken, and in October marking of haddock was carried out from a commercial vessel in the same area.

Work on the Fish Species.

Cod.

The sampling from the seasonal cod fisheries has been continued. In Lofoten 20,585 cod were measured and otoliths of another 9011 sampled. From the Spring Cod Fishery in Finmarken 1384 otoliths were sampled, and from the Barents Sea and Svalbard areas a total of 25,553 cod were measured and the age of 7185 determined by help of otoliths.

The marking experiments have been continued and extended: 1220 fish (caught by purse-seine) were released on the Lofoten banks and a total of 1999 fish were released from the "G. O. Sars" at different localities in the Barents Sea.

Haddock.

Otoliths of 4706 haddock were sampled from northern Norway and the Barents Sea.

The marking experiments started in 1952 were continued and a total of 918 marked haddock were released during the year. A report on the results of these experiments has been prepared for the *Annales Biologiques*, Vol. XI.

Saithe.

Sampling for age and growth analysis has been carried out off western Norway in winter and in northern Norway in summer and autumn. A total of 2180 otoliths were collected.

655 saithe were marked during the summer and autumn. A preliminary report on these marking experiments can be found in *Annales Biologiques*, Vol. XI.

Scotland

(R. Jones).

Work at Sea.

The research ships "Explorer" and "Scotia" were in full commission throughout the year, "Explorer" being largely confined to the North Sea and "Scotia" to Faroese and far northern grounds. A limited amount of trawling was carried out by "Scotia" at Faroe but fish sampling of a more intensive nature resulted from "Explorer"'s cruises. In particular, three cruises in April—May, June—July and July—August, were concerned with an extensive trawling programme, designed to sample the haddock and whiting stocks in the northern, north central, central, and eastern part of the North Sea as far south as the latitude of Aberdeen. In addition, a small number of haddock and cod were tagged off the north coast of Scotland in January. During August and September, "Explorer" was engaged in experimental trawling work in the Buchan Deep. In this work, the effect of trawl duration and speed of towing on the numbers and size composition of haddock was investigated.

Work on the Fish Species.

Cod.

Little work is being done on cod in Scottish waters, apart from a survey of its food and feeding habits and its variation in time and space.

Haddock.

Haddock data collected by research ship in the North Sea and from the fish market in respect of Faroe grounds will be made available in *Annales Biologiques*, Vol. XI. In addition, various lines of research are being pursued in the laboratory.

From an analysis of market samples of Faroe haddock, the relationship between mortality and fishing effort is being studied. The end of 1954 marked the completion of the fifth year of this study. Population studies of the North Sea haddock stocks have been continued, bearing in mind that (a) the distribution of effort in the North Sea is far from uniform and (b) that fishing mortality is not necessarily independent of age and might in fact increase with age.

A report on the growth of haddock at Faroe and in the North Sea during post-war years has been prepared and an investigation into the effect of mesh selection on the size of haddock is being made. Of a more theoretical nature were reports submitted to the Council's last meeting containing accounts of the statistical techniques required for an analysis of trawl-haul data and the estimation of survival rates.

Whiting.

Population studies of the North Sea whiting stocks are being continued at a fairly elementary level. In addition a preliminary review of the biology and bionomics of the whiting has nearly been completed for publication and a paper has been published on the food and feeding habits of the whiting.

Sweden

(S. I. K. Sörensen).

Cod.

Samples were taken in the Åland Sea in September.

Whiting.

In 1954 an investigation of the biology of the whiting has been started. Fishing experiments from the R/V "Skagerak" have been carried out at different seasons in the Skagerak and the Kattegat in order to ascertain the composition of the stock at different localities and at different seasons, and to study the spawning and the growth-rate.

Publication.

Jones, R., 1954: "The food of the whiting, and a comparison with that of the haddock." Mar. Res. Scot., 1954, No. 2.

Herring Committee.

1954

By W. C. Hodgson

Belgium

(Ch. Gilis).

During 1954, the study of the herring concentrations exploited by the Belgian herring trawlers has been continued.

(a) The full-herring concentrations of the northern and central areas of the North Sea during August, September, October, and November (1452 herrings).

In order to ascertain the transition of the herring from the stage "full" to the stage "spent", the study of the full herring was—as during 1953—continued during the month of November.

(b) The spent-herring concentrations of the southernmost area of the North Sea:—

i) in January and February, end of the season 1953—54 (571 herrings),

ii) in December, beginning of the season 1954—55 (405 herrings).

The observations cover all biological values: length weight, sex, stages of maturity, fat, age, vertebrae, keeled scales (K_2), stomach contents, and a biological scale. A complete study of the activity of the trawlers, the fishery, and the landings is also given for both these groups.

Tagging Experiments. Several cruises were organized in an attempt to tag a large number of herrings. However, owing to bad weather and the lack of finding dense concentrations, they were not successful. Only a small number of herring was tagged, the Lea tag being used.

Denmark

(Å. Vedel Tåning).

Inner Danish Waters (Skagerak, Kattegat, Belt Sea, Baltic).

Quantitative fishing for herring fry with the 2 m. stramin-net was carried out from the R/V "Biologen" during March, May, June and November (cf. the report for the Near Northern Seas and the Baltic-Belt Seas Committees).

Samples of adult herring from commercial catches were analysed for length, maturity, age and race; *inter alia* 6 samples from the Skagerak were secured in January—February, and several samples (more than 50) of young herring from samples from the fishery for processing were secured from all seasons.

Sampling of stomachs of herring was carried out from the Bornholm area for studies on the food of the herrings.

Of **sprat**, 14 samples from Skagerak, Kattegat, and the Belt Sea were analysed.

North Sea.

The stock of herring especially in the Bløden Ground area was studied during all seasons. Research work was carried out from the "Dana" (May and September) and the experimental cutter "Jens Væver" (June, July, and August), and samples for analyses of age-groups, etc., were secured from commercial landings in Esbjerg, also from all seasons. The food of the herring was studied by sampling of stomachs. Reports on the results are given in *Annales Biologiques*, Vol. XI.

Faroe-Iceland Waters.

Extensive work has been carried out especially in the area north and north-east of the Faroes, as far north as to 66° N. Lat. and east to about 1° W. Long. The dispersion and migration of herring was studied in December 1953 and January 1954 from two herring cutters ("Jacob Henriksen" of Skagen, and "Kúrberg" of the Faroes) and sampling carried out. A general survey of the herring distribution in relation to the hydrography of the area was moreover carried out by the "Dana" during June in collaboration with the Norwegian and Icelandic research vessels. Samples were secured from the area. Hydrography was carried out in the whole area investigated together with

zooplankton sampling. In July supplementary echo-sounding of herring shoals was carried out in the area by the inspection vessel "Thetis".

England

(W. C. Hodgson).

Extensive sampling of herring stocks of the east coast has been continued. During the autumn fishery off East Anglia 3000 scales were examined and 85,500 fish were measured on the markets and in kippering houses, etc. In connexion with the study of the herring of the Northumberland coast 3000 scales were examined, and in the Whitby area another 1500 scales were dealt with as well as 6000 market measurements.

During a cruise to the Bløden Ground 690 scales of young herrings were taken, and vertebral counts were also made.

The study of the otolith of the herring has been continued and 1900 otoliths have been taken from samples ranging from Northumberland to East Anglia, and also from research vessels.

Tagging has also been continued in the various fisheries, and during the year 5211 tagged fish were liberated. There have been 40 returns to date.

Two coastal surveys of the 0-group herring have been done, one during May between Amble (Northumberland) and Lowestoft, and the second during July and August between Blyth and Orfordness.

Echo-sounding surveys were carried out continously between mid-March and June in the area Devil's Hole to Whitby.

Experiments with various gears have been continued with a view to explaining the great differences between day and night catches of herring larvae. The use of the high-speed tow net by both day and night suggests that the difference has been due to the active avoidance of the slow moving nets in daylight by the larvae.

France

(Institut des Pêches).

L'étude des populations de harengs du sud de la Mer du Nord et de la Manche Orientale a été poursuivie durant les campagnes de pêche d'hiver 1953—54 et 1954—55.

Elle a porté au cours de l'année 1954 sur la taille, l'âge, le stade sexuel et la moyenne vertébrale de 1400 individus.

Germany

(A. Bückmann).

Institut für Seefischerei, Hamburg.

The programme of work followed in 1954 was in the same general lines as that outlined in the Administrative Report for 1953.

71 samples from commercial catches at sea from all types of fishing gears were analysed for racial characters, age, sex, stage of maturity, weight and length. Especially work on the use of gillrakers as a "race" character has been continued. The samples were obtained from the following areas:— Shetland, Viking to Lingbank, Fladen, Gut, off the English and Scottish east coasts, from Dogger Bank, "Binnensee", Channel Clay Deep area.

In addition, 44 samples taken from the ports of Hamburg and Cuxhaven were analysed.

Continuous hydrographical observations and soundings were undertaken by the German Fishery Protection vessels in the above-mentioned areas.

Material collected previously has been worked up (age determination). The work on the herring in connexion with the thermocline was continued.

Institut für Küsten- und Binnenfischerei, Hamburg.

The investigations made on oil-herring fishing in the southern North Sea were continued, dealing mainly with the problem of its damaging effect on the food fish referred to by the North Sea Convention. From July to October 43 samples weighing 1500 kg. were taken from the catches and examined for the number of each species and size of the fish. 88·7% of the total weight of the catch consisted of herring, 1·8% of haddock and 1·4% of mackerel, horse mackerel, dab, cod, gurnard, and plaice. 1·5% of the weight were undersized as compared with the North Sea Convention, i. e., 0·5% less than 1953.

Institut für Fischereibiologie der Universität Hamburg.

Herring larvae from the inshore areas of the German Bight were investigated for their stages of development (ossification, allometry, development of the gut, body weight) in relation to body weight.

The data collected in 1953 concerning the distribution and size of herring larvae were evaluated. The results tend to show that at least in 1953, the very small herring larvae, found during March in modal lengths below 15 mm., cannot have originated from the spawning grounds near the Channel entrance.

Institut für Meereskunde, Kiel (R. Kändler).

The composition of the stocks of young herring in relation to size and race were studied in the course of the year. The investigations on the amount of fatty acids in herring oil in relation to the stage of maturity were completed.

Iceland

(Árni Friðriksson).

During the months June—October the fishery patrol boat "Ægir" which has now been partially equipped as a research vessel, made an extensive search for herring by means of Asdic and echo-soundings all around Iceland, but particularly off the north and east coasts. In June the vessel carried out the Icelandic part of the international herring research programme in the waters between Norway and Greenland co-operating with "Dana" and "G. O. Sars". After

the completion of the cruises the vessels met in Thorshavn (Faroes) on 25. June in order to compare the findings and compile a short report.

The laboratory in Siglufjord, North Iceland, was run during July and August as usual. 2094 herrings, originating from the commercial fishery, were investigated in the usual manner (length, sex, maturity stages, weight, intestinal fat, V.S., and maturity factor). Scales (and otoliths) were sampled for later age-readings, growth measurements, racial analyses, etc. As "Ægir" was equipped with drift-nets, it was also possible to collect samples from the open ocean far offshore and all around the coasts of Iceland. These samples comprised 1439 herrings and were collected during June—September. The total number of herrings investigated in the usual manner in the Siglufjord laboratory consequently amounted to 3533. Besides this, 9076 tagged herrings were measured. Some herring stomachs were analysed for food content as usual.

The same motorboat as in 1952 and 1953 was chartered for the purpose of herring tagging. The staff was practically the same as before. 13,762 herrings were tagged, 8783 off the N. coast (internal) and 4979 off the SW. coast (4571 internally and 408 externally). Experiments on the vitality of tagged herring were made in August off the SW. coast.

Netherlands

(B. Havinga).

The programme of work in 1954 was along the same lines as that in 1953.

The main problem studied was to get additional information on the existence of different herring populations, and the behaviour and migration of these populations.

The relation between echo-traces and catch has been studied onboard a commercial drift-net vessel in the central North Sea, in June. During the cruises of the "Antoni van Leeuwenhoek" in July and September herring samples have been taken north of and in the Dogger area. These cruises were much hampered by bad weather so that the cruise programmes had to be curtailed.

Samples of herring spawning in the Sandettié area and in the English Channel have been taken onboard commercial trawlers.

From these herrings, data have been collected for the analysis of the characters of the shoals in the different areas.

The collection of statistical data from the commercial fishing fleet has been continued.

Different types of echo-sounders have been studied and an Elac Asdic apparatus has been tried for fish detection in shallow coastal waters.

Norway

(Finn Devold).

Routine work was carried out in 1954 on the same scale as in previous years. The following samples of herring were secured:—

Large herring.....	27 samples	about	5400 fish
Spring herring.....	6 ,,	,,	1200 ,,
After season.....	2 ,,	,,	400 ,,
Norwegian Sea.....	9 ,,	,,	1800 ,,
North Sea.....	4 ,,	,,	800 ,,
Fat herring.....	3 ,,	,,	600 ,,
Total...	51 samples	about	10,200 fish

Cruises for herring investigations were carried out with "G. O. Sars" in January, and we succeeded in following the shoals on their last 200 miles of migration from the Norwegian Sea to the Norwegian coast. Every day the fishermen received information about the position of the front of the approaching shoals. In February, investigations on the behaviour of the herring were carried out in Norwegian coastal waters.

In collaboration with Denmark and Iceland a great part of the Norwegian Sea was covered with a network of hydrographic sections in June. Herring shoals discovered on these cruises were recorded on charts which were distributed among the fishermen.

In July and August the investigations were particularly concerned with the charting of dense herring concentrations in the Norwegian Sea.

Cruises with the "G. O. Sars" were undertaken in November and December off the west and south coast of Norway and in the Norwegian Sea in the area between Iceland, Faroes and Norway.

Herring Tagging (Olav Dragesund).

In all, 38,827 herrings were tagged on the Norwegian coast in 1954. Of these, 11,242 were large herring, 11,491 spring herring, and 16,094 fat herring. A total of 2630 herring were doubly tagged (internal steel tag and the Lea hydrostatic tag), 900 with Lea tag, and 35,297 with the internal steel tag.

The numbers recovered in 1954 are listed in Table 4 in the *Annales Biologiques*, Vol. XI, Herring Section.

A report on tagging experiments conducted in collaboration with Iceland is in press (Friðriksson and Aasen).

Scotland

(H. Wood).

The Scottish research programme was planned on the same lines as in 1952 and 1953, and the Department's research vessel "Clupea" and the Herring Industry Board's "Silver Scout" were engaged in the following investigations on the east and west coasts of Scotland.

1. January—March: Investigation of the herring of the North Minch including experiments with pelagic trawls.
2. April—September: Hydrobiological surveys in the north-western North Sea extending from Lat. 56°00′ N. to 58°30′ N., and from the Scottish coast to 2°00′ E. Supplementary observations extending north and east of the area given were supplied by the research vessels "Explorer" and "Scotia". Analysis of the material collected was shared with

the staff of the Scottish Marine Biological Association in Edinburgh.

3. October—December: Extensive surveys on the west of Scotland to locate spawning grounds and to determine drift of the larvae.

Investigations into the hydrography of certain sea lochs on the west of Scotland were continued.

Daily sampling of catches was pursued whenever practicable at the chief fishing ports on the east and west coasts for the collection of data relative to long-term population and racial investigations. Otolith study has been extended and the distribution of distinctive otolith types is being followed, while the relationships between otolith types and l_1 types are being studied; differences in the structure and shape of cranical bones are also being considered in relation to the "race" question.

The following is a summary of fish tagged which were considerably fewer than in the previous year:—

February	Ballantrae Bank (Clyde)	adult stock	1149
March	Moray Firth	"halflin" stock (2 to $2^1/_2$ years)	242
May—August	Shetland and Scottish east coast	mainly adults	3392
November—December	South Minch	mainly adults	319

In the Scottish tagging experiments both Scottish and Lea hydrostatic tags were used with a "one-man" bridle or toggle attachment.

A number of tagged and untagged herring were maintained together in an aquarium for observation on relative mortalities of the two groups, the incidence of tag shedding and the behaviour of the tagged fish.

Sampling of herring of the 0- and I-groups was continued more especially in the Moray Firth and Firth of Forth, and the relationship of these to the open sea stocks of adult fish is under investigation.

Surveys designed to trace the distribution of herring larvae and the early post-larval forms were undertaken between August and September both off the east and west coasts of Scotland.

Fat analysis of autumn spawning herring of the Minch in relation to feeding and the maturation cycle was continued and similar investigations were inaugurated with regard to spring spawners of the same region.

Contact was maintained with echo-sounder developments, and extensive echo-sounder surveys were made both on the east and west coasts of Scotland to determine the extent and distribution of herring shoals for application to herring population studies. Results were conveyed to fishing vessels and in June and July search surveys with echo-sounder were made with the object of helping the Shetland herring fleet during a period of poor catches.

Experiments in the hatching and rearing of herring under controlled conditions were repeated and crosses between spring and autumn spawners were effected by using stored sperm.

Attempts were made both on the Minch and North Sea herring grounds to capture herring by means of various designs of pelagic trawl but catches were somewhat disappointing.

Sweden

(H. Höglund).

The herring research work in 1954 was carried out mainly along the same general lines as in 1953.

1. Tagging experiments with the Lea tag were continued:—
   (a) In spring off the northern part of the Swedish west coast. Owing to hindering ice, tagging could not start as early as usual and scarcity in the live herring supply restricted the number of liberated fish to some 400.
   (b) In autumn in the Dogger Bank area, where 579 herring were released. Continuous bad weather made the work difficult.
   (c) In June 500 herring were tagged and released in the Bothnian Sea.
2. About 5000 herrings from the Skagerak, the North Sea, and the Baltic were examined in the usual manner.
3. Particular interest was paid to the herring stock that spawns in March in the outer archipelago along the Bohuslän coast. In connexion with this work hydrographic observations were made and plankton hauls taken regularly from early March to early May.

Publications.

Blaxter, J. H. S., 1953: "Sperm storage and cross-fertilization of spring and autumn spawning herring." Nature, **172**, 1189, London.

Craig, R. E., 1953: "The future of echo detection." World Fishing, **2**, 303.

— 1954: "Echo-sounding in marine biology." Adv. Sci., **11**, 51.

Cushing, D. H., & Richardson, I. D., 1955: "Echo sounding experiments on fish." Min. Agric. Fish., Fish. Invest., Ser. 2, **18**, 4. London.

Comité de la Sardine.

1954

Par J. Cuesta

Angleterre

(W. C. Hodgson).

During the year no biological work has been carried out on the pilchards of the western part of the English Channel. Instead trials have been started with the Spanish lampara net, which has been specially made for fishing in Cornish waters. In connexion with the lampara, lamps of 36,000 candle power were imported from Spain and tests have already shown them to be effective. The cruises of the research vessel which have been devoted to this work were mainly for the purpose of training the crew in handling the gear, but now that the technique has been mastered it is hoped during the current year to try to fish the net commercially.

In addition to this gear work several echo-surveys have been carried out in the region of Land's End at a time when pilchards were scarce.

Espagne

(J. Cuesta).

Des observations systématiques ont été poursuivies, sur des échantillons de pêches commerciales de sardine et anchois, par les divers laboratoires côtiers (St. Sebastien, Santander et Vigo) en relation avec la biométrie et la reproduction des deux espèces.

Par le laboratoire de Vigo de l'Instituto de Industrias Pesqueras, des nombreuses observations furent faites sur la fécondité absolue dans des individus de différantes tailles ainsi que sur la valeur fonctionelle des branchiospines, son apparition dans les jeunes et sa variation numérique en relation avec la taille du poisson. Des otolithes d'anchois et de sardines ont été separés pour l'étude de la croissance.

France

(Institut des Pêches).

En 1954 les travaux suivants ont été effectués:—

Biométrie : (Taille, moyenne vertébrale et taille à l_1).

St. Jean-de-Luz: de Mars à Novembre, le stock présent dans la région bascolandaise a été regulièrement examiné.

La Rochelle: un examen identique a été effectué de Mai à Novembre dans la région comprise entre l'île d'Yeu et l'île d'Oléron.

Ces observations ont été complétées dans la région de Belle-Ile en fin Juin—début Juillet, en Baie de Concarneau, en Juillet.

Marquage: 14,300 sardines furent marquées avec agrafe chirurgicale fixée dans la région caudale et portant un petit anneau de plastique coloré:—

du 12—22 Mai, dans la région de St. Jean-de-Luz (5000);

du 29 Juin au 1er Juillet dans les eaux de Belle-Ile (3500);

du 5—8 Juillet, en Baie de Concarneau (5800).

Détection: Des essais de détection par appareils ultra-sonores ont eu lieu en Avril au large de la côte basque, en Juin—Juillet, dans le nord du Golfe de Gascogne et en Octobre, devant la côte de Vendée.

Irlande.

Aucune investigation a été effectuée.

Norvège

(G. Dannevig).

Sprat.

The abundance and distribution of newly hatched larvae have been studied in radar to locate the spawning grounds of the sprat.

Routine investigations on age and growth of sprat from the commercial catches have been made.

The number of vertebrae has been analysed in an attempt to identify various populations within the Norwegian waters.

Portugal

(A. M. Ramalho).

Continuation des observations selon le programme des années précédentes (taille, poids, écailles, vertèbres, maturité sexuelle) à Leixões, Lisbonne, Portimão, et autres ports de pêche.

Comité des Poissons Scombriformes.

1954

Par F. Frade

Allemagne.

Voir rapport du Comité de la Mer Baltique-Belt.

SCOMBRIDÉS

Danemark

(Aa. J. C. Jensen).

Des recherches concernant la ponte du maquereau ont été menées à bien (en collaboration avec l'"Institut für Meereskunde" de l'Université de Kiel — Prof. R. Kändler), dans les eaux du Kattegat, du Belt et de l'ouest de la Mer Baltique. En Juin, des pêches planctoniques ont été faites, dans le secteur danois, au nord de la ligne Korsør—Nyborg—Fredericia et dans le Sound, avec les bateaux "Biologen", et "Havkatten", respectivement.

Irlande

(A. E. J. Went).

Aucune investigation en relation avec le Comité des Poissons Scombriformes n'a été faite en Irlande pendant 1954.

Norvège

(G. Dannevig).

Des échantillons provenant de la pêche commerciale ont été récoltés pendant la saison, en vue de l'étude de l'âge, de la croissance et de la maturité des maquereaux.

Dans les fjords norvégiens de l'ouest, ainsi que dans le sud, au large, des expériences de marquage ont été effectuées.

Un résumé, par A. Revheim, des résultats obtenus est publié dans les *Annales Biologiques*, Vol. XI.

THONIDÉS

Allemagne

(A. Bückmann).

Pendant les deux dernières années les thons — *Thunnus thynnus* — débarqués à Bremerhaven, Cuxhaven, Hamburg et Kiel furent mesurés et pesés, les lieux de pêche ayant été enregistrés. Parmi les 3100 thons débarqués, 2400 individus, de 2 à 3 m. environ de longueur et tous mûrs, ont été examinés. Les marquages qui avaient été prévus n'ont pas été effectués, puisque la ligne électrique n'était à même d'être utilisée qu'en fin de la saison de pêche. L'efficacité de la ligne électrique a été d'ailleurs démontrée au large de la côte de la France méridionale aux environs de St. Jean-de-Luz, par la fait que l'électronarcose empêche le poisson ayant touché l'hameçon de s'en aller, ce qui fait augmenter le nombre des captures d'environ 100%.

Il a été reconnu que l'utilisation du perlon ou du nylon comme ligne augmenta l'attraction des thons pour l'amorce, possiblement à cause de la transparence de la ligne dans l'eau.

Espagne

(J. M. Navaz).

Au laboratoire de l'Institut Espagnol d'Océanographie à Vigo, on a fait l'étude statistique et de pêche sur les thonidés.

Au Laboratoire Océanographique de San Sébastian, on a poursuivi l'étude biométrique des différentes espèces de thonidés qu'on a capturés sur la côte basque, pendant la période comprise entre la fin de Mai et la mi-Novembre. Quelques observations sur les modalités de la pêche dans cette région ont également été effectuées.

France

(Institut des Pêches).

En Juin 1954, l'étude des conditions hydrologiques au large du Cap Finisterre, poursuivie depuis plusieurs années, a été reprise par le "Président Théodore Tissier". Le retard constaté dans le réchauffement des eaux superficielles cette année a coïncidé avec un retard de 2 à 3 semaines dans l'apparition du germon (*Germo alalunga*). En Septembre, un lot de 115 exemplaires a été examiné dans la région de St.-Jean-de-Luz.

Un essai de pêche aux lignes électriques a été fait, en Juin, au large du pays Basque. Un lot de 200 thons rouges (*Thunnus thynnus*) a également été mesuré.

Portugal

(F. Frade).

Des recherches portant sur les thonidés africains (*Neothunnus albacora* et *Euthynnus alliteratus*, notamment) ont été amorcées dans les eaux équatoriales des îles de S. Thomé et du Prince, par la Mission Scientifique de S. Thomé.

CARANGIDÉS

Espagne

(J. M. Navaz).

Au laboratoire de l'Institut de Recherches des Pêches à Vigo, on a commencé l'étude du "chinchard" (*Trachurus trachurus*), espèce qui est l'objet d'une pêche saisonnière très abondante dans le nord et le nord-ouest de l'Espagne.

Une attention toute spéciale a été consacrée à l'étude de certains caractères pour la différentation des populations, ainsi qu'aux études morphologiques et histologiques des jeunes.

Dans le but de déterminer le dégré de l'appauvrissement des eaux en certaines espèces, par l'effet de la filtration à travers l'appareil branchiospinal, les branchiospines ont été étudiés à ce point de vue.

Portugal

(A. M. Ramalho).

Etude de la croissance de *Trachurus trachurus* pendant la première année de sa vie (35 échantillons étudiés du 12 Juillet au 28 Décembre). Un résumé, par A. M. Ramalho et J. S. Pinto, des résultats obtenus est publié dans les *Annales Biologiques*, Vol. XI.

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Salmon and Trout Committee.

1954

By A. E. J. Went

Denmark

(Knud Larsen).

Biological Investigations. Biological investigations into salmonid fishes were as follows:—

(a) Tagging and marking experiments. In 14 localities 771 adult sea trout were tagged by means of celluloid tags.

(b) Analyses of the stock of young sea trout and stationary trout by means of D.C. electro-fishing were carried on in two streams in Jutland.

(c) Investigations into the sea trout run as to the composition by age, sex, etc., were carried out in 10 streams by electro-fishing.

(d) The biology of the grayling, the pike, and the burbot in trout streams. Collections have been made, and these investigations are now finished.

(e) Salmon investigations in the Baltic. Length measurements of commercial catches were carried out in March and November. Scale samples were obtained in January and in the autumn.

England and Wales

(F. T. K. Pentelow).

Salmon Stocks (W. G. Hartley).

The only considerable collection of material received this year has been that from the Northumberland and Tyneside River Board, though isolated enquiries have been received from other River Boards, institutions, and private individuals.

The collection from the Northumbrian region contains legible scales of 92 salmon, 51 sea trout, and 11 brown trout and has been considered in comparison with previous Northumbrian collections.

Table 1 shows that the proportion of spring fish has gradually fallen. This was due to a high proportion of previously spawned fish in 1953 and of grilse in 1954.

Some of the scales showed the obscure winter bands noted in 1948 in the Whitby collections, and this in conjunction with the wide variation in weight made the scales, particularly those of sea trout, difficult to read.

Table 1. Percentage of smolt age-groups and of principal adult groups.

Year	Smolt ages in years 1	2	3	Sea life in years .1+	.2	.2+	SM	Total
1952.....	12·8	86·0	1·3	16·7	33·4	34·6	6·4	78
1953.....	12·4	89·0	8·5	9·8	29·3	36·6	17·1	82
1954.....	10·9	82·6	6·5	27·2	24·0	36·0	5·5	92

(In this table the figures given for 1953 in the last report have been amended to take account of scales received after it was written, which alters the proportions of spring and summer fish.)

One salmon was caught at sea, in the Fastnet area, bringing the total number up to 5 salmon and 1 sea trout from this area in the last 3 years.

Sea trout scales continued to be collected from the Sussex Ouse.

Salmon Migration Experiment (W. G. Hartley and A. Swain).

Salmon were tagged in the North Sea off the mouth of the River Coquet, and the fish were brought from fishermen.

In all, 127 salmon were tagged and released between 18. June and 31. August, in Alnmouth Bay, about $^1/_2$ mile north of Amble Pier. Of these, 32 or 25% have so far been recaptured. 14 were taken in Alnmouth Bay, near where they were tagged, 3 in Druridge Bay just south of the mouth of the Coquet, and 1 in the River Tweed at Low Bells. Of the fish recaptured in the sea the longest time of absence was 22 days, for a fish caught at Amble. Five of the fish recaptured in the Coquet were absent for longer periods, the maximum being 41 days. These 5 fish were all taken after the end of the netting season.

It looks as if fish in Alnmouth Bay be at the end of their migration. Whereas fish from Whitby were recovered at Amble, the only fish of the Northumberland tagging reported outside the immediate vicinity of the Coquet was the single fish in the tidal waters of the Tweed.

Salmon and Sea Trout Tagging
(A. Swain, W. G. Hartley and F. Gervers).

The investigations into the movements of sea trout and salmon from a river in the North East of England were continued during 1954. Sea trout and salmon smolts and kelts were tagged in the River Coquet at Warkworth, Northumberland. The fish were caught by the method adopted in previous years; that is, by using a wooden trap inserted into one of the pools of a fish pass at Warkworth Dam. The trap was placed in position on 14. March but most of the smolts did not migrate until the second fortnight in April and during May. Tagging proceeded until 28. May by which time 5022 sea trout smolts, 1021 sea trout kelts, 2859 salmon smolts and 37 salmon kelts had been tagged. Small coloured plastic tags were used for the smolts and the Lea hydrostatic tag for the kelts. The trap was put into operation again in mid-June and was finally removed during the second week of August. No downstream migration was observed during this period.

Up to the end of October, only 7 of the sea trout smolts had been recaptured. Six of these were taken off the Norfolk coast and one in the Coquet at Morwick, still in smolt condition. 109 sea trout kelts were recaptured representing 10·5% of the total number tagged. Details of where these were caught are shown below:—

Place of recapture	Number caught
River Coquet.....	29
River Tweed	2
Northumberland coast....	62
Yorkshire coast.....	4
Norfolk coast.....	4
Danish coast	3
Dutch coast.....	1
North Sea.....	4

Many of the Coquet fish were taken in the estuary but 4 were caught near Felton and 8 in the Rothbury area.

The Tweed fish were caught at the Yardford and Bendiburn fisheries.

From these results it appears possible that quite a large proportion of the sea trout kelts do not travel far from the parent river. The poor returns of young sea trout from the East Anglia coast may be partly due to the use of larger mesh nets in that area.

No salmon smolts have been taken but one salmon kelt was caught in the River Coquet shortly after being tagged.

Recaptures of fish tagged in earlier experiments were reported during the 1954 fishing season. A single sea trout tagged as a smolt in 1951 was caught off the Northumberland coast.

Of the smolts tagged in 1952, ten were caught as adult fish during the year. Five of these fish were netted off the Northumberland coast and one was taken in the River Tweed at Heughshields. The 4 remaining fish were caught as kelts on the trap at Warkworth.

Thirteen of the smolts tagged in 1953 have been recaptured this year. Twelve of these were taken off the Northumberland coast and one in the River Coquet at Warkworth. The 1953 smolt-tagging experiment has yielded very poor returns, the total recapture rate being only 0·35%. However, a further 28 of the 1953 sea trout kelts were recaptured. 6 of these were caught off the north-east coast, 21 in the River Coquet and 1 in the River Tweed at Norham. Of the 21 fish taken in the Coquet, 7 were caught in the estuary, 10 in the trap at Warkworth and 4 in the upper waters. These bring the total number of recaptures to 12·5% of the kelts tagged.

1952 was the first year during which salmon smolts were tagged and 27 of these fish were caught in 1954. Together with the 11 grilse caught in 1953, the total percentage recaptured is now 1·8.

Of the salmon smolts tagged in 1953, 32 (0·9%) have been caught during the season as grilse. The table below shows where the fish were caught.

Place of recapture	Number caught of fish tagged in 1952	in 1953
River Coquet	7	8
River Tweed (Hallowstell fishery)	1	—
River Esk (Yorkshire)	—	1
Northumberland coast	19	22
West coast of Scotland	1	1
Total...	28	32

Up to the end of October all the recaptured salmon tagged as smolts in the River Coquet had been taken either in or near the river or to the north. Of those taken in the Coquet 9 were caught in the estuary and 6 in the upper waters. However, on 31. October, one of the fish was recaptured as a grilse in the Yorkshire Esk at Donkins Holm between Grosmont and Sleights.

The scales from 281 of the salmon smolts tagged this year have been read. It was observed that 92·2% of the fish were two years old, 4·6% one year old and 3·2% were three years old. The fish migrating before the end of April had put on very little, if any, extra growth during the spring. The one-year-old fish showed the greatest amount of spring growth, and nearly all of them migrated after the 19. May, that is, during the final week of the experiment.

The staff of the Scottish Home Department continued to collaborate in these experiments and tagged sea trout smolts in the River Tweed during May.

Finland

(Erkki Halme).

The following numbers (in 1,000) of salmon fry were liberated during the year:—

Oulu River	116·5
Kemi River	413·0

140 salmon and 71 trout, with an average weight of 5 to 6 kg. were caught at Isohaara Power Station (Kemi River) and tagged with celluloid tags and liberated in the Kemi River above the station.

France

(R. Vibert).

Recherches Physiologiques et Biologiques.

Les recherches entreprises sont poursuivies. Les travaux de marquage de smolts commencés en 1951—1952 et 1953 ont été poursuivis en 1954. Jusqu'à présent et au total 12 saumons adultes ont été repris dans leur rivière d'origine (aucun ailleurs) — 6 après deux ans de mer, 4 après trois ans de mer et 2 après deux ou trois ans (tube avec message intérieur de Lea arraché). Six post smolts ont été recapturés au large de la Bretagne.

Propagation Artificielle du Saumon.

La récolte de Décembre 1954 a été à peu près nulle du fait des niveaux d'eau constamment défavorable.

En Normandie les essais de réacclimatation de saumons dans la Risle ont donné leurs premiers résultats, provenant vraisemblablement des déversement d'alevins effectués en 1950. Une cinquantaine de sauts de saumons aux barrages a été signalée (poissons de 50 à 80 cm.).

Prises de Saumons.

Très bonne campagne en 1954 d'une façon générale. Accroissement du nombre des captures de truites de mer.

Germany

(R. Kändler).

In the spring of 1954 200,000 fry of sea trout were liberated in some small rivers flowing into the Kiel Bay.

Because of bad weather and the unfavourable conditions for catching the ripe parent fish, only 120,000 eggs of sea trout were obtained. Therefore, 300,000 eggs were purchased for breeding purposes from Denmark.

The collection of statistical data on the drift-line salmon fishery in the south-eastern part of the Baltic was continued. Age determinations of about 2000 salmon were made. The variations in the size and weight groups were studied in the course of the fishing season, as in the past few years.

Scales have been taken from a number of sea trout caught in the eastern Baltic and in the rivers flowing into the Kiel Bay.

Iceland

(Þór Gudjonsson).

Work with the salmon and trout has been carried out along the same lines as in previous years. Scale samples of salmon and trout have been collected for age analysis and growth studies, and marking of smolts and tagging of kelts were continued. In the River Ulfarsa 799 salmon smolts and 74 sea trout smolts were marked by cutting fins. In two rivers 162 kelts were tagged with hydrostatic tags, 136 in the River Ellidaar and 26 in the River Bugda.

Hatchery operations were carried out at four centres, mainly with salmon ova. Fry and one-summer-olds were liberated into several rivers.

The salmon catch was below average.

Ireland

(A. E. J. Went).

Biological Investigations.

During 1954 material from the River Shannon was collected along the usual lines but owing to the pressure from the work it was not found possible to

examine this and other material obtained in the years 1952 and 1953. Tagging of clean salmon in the sea was carried out at the end of June from commercial vessels fishery drift-nets from the ports of Downings, Bunbeg and Buncrana. Altogether 124 fish were tagged and 15 fish were recaptured in the Rivers Moy (5), Erne (2), Crolly (1), Louisburg (1) and Waterville (1) and from the Yellow River (1) near Falcarragh, Co. Donegal and Teelin (1) and Inver (1) Bays. The fish recaptured at Waterville travelled a minimum distance of 270 miles in 40 days representing a minimum speed of 5·5 miles per day.

Smolt tagging was carried out at Clondulane on the River Blackwater and at Ardnacrusha on the River Shannon. Conditions on the River Erne were found to be unsuitable for smolt tagging and the proposed work was therefore abandoned. Recaptures of fish tagged as smolts in previous years have so far been few in number.

Kelts were tagged at Glenties, Co. Donegal, Ballisodare, Co. Sligo, Treanlaur, Co. Mayo, and Banteer, Co. Cork, mainly in conjunction with hatchery operations. Some fish tagged as kelts in previous years were recaptured but the material obtained so far is not sufficient to warrant a further report.

Officers of the Fisheries Branch of the Department of Agriculture, Dublin, again collaborated with the officers of the Ministry of Commerce, Belfast, in working out the results of tagging experiments conducted at Portballintrae, Co. Antrim, and also in research work into the salmon and sea trout of the River Foyle. A report on the work carried out on River Foyle is included as an appendix in the Third Report of the Foyle Fisheries Commission.

Experiments designed to investigate the behaviour of salmon moving up the Shannon estuary were commenced in conjunction with the Electricity Supply Board in 1954 and the results of the taggings were being worked out at the close of the period under review.

A short report on the sea trout of a tributary of the River Boyne, the River Mattock, was prepared and published during the year. A collection of scales with relevant data from the sea trout of the Cashla River, Connemara, were also examined and a report thereon was prepared for publication.

The effects of the removal of coarse fish (perch and pike) from trout waters were investigated by Dr. Anne Healy and a short report was published in the Department of Agriculture Journal. In connexion with this work Dr. Anne Healy published a paper on the biology of the perch in three Irish lakes, based on the material obtained in connexion with the above-mentioned experiments.

A scheme for the experimental enrichment of certain small acid lakes on the western sea board of Ireland was continued during the year.

Returns of Catches, etc.

Returns of catches are demanded annually from every holder of a licence to fish for salmon and sea trout. The returns for 1954 have now been compiled and the catches of salmon amounted to approximately 900,000 kg. compared with approximately 820,000 kg. for 1953. Sea trout catches amounted to 32,000 kg. compared with 28,000 kg. for the previous year. The present figures for catches are not strictly comparable with those of the years prior to 1952 since the large catch made in the River Foyle formerly included in the national returns are now omitted in view of the establishment of the Foyle Fisheries Commission.

Large spring fish which form an important element in the runs of salmon in the months of January to March in most early Irish rivers appear to have been more plentiful than in the previous year and in rivers in the south-east of Ireland this group was relatively numerous. The runs of other spring fish were generally good in more rivers. For the second year in succession the runs of salmon from the middle of May until the middle of June were very poor. As in 1953 the grilse did not run in force until at least 3 weeks later than usual so that the break in the runs was well into July.

Artificial Propagation of Salmon and Trout.

During the season conditions from the artificial propagation of salmon and trout were favourable and the output fry (in 1,000) was:— Salmon, 1578, Sea trout 33 and Brown trout 2182. Supplies of ova were also computed from Great Britain.

Scotland

(K. A. Pyefinch).

Work on the major scheme of salmon research was not started during 1954 and it is now very unlikely that this scheme will be started in its original form, although there are good prospects of a modified scheme being started in 1956. Work on other salmon research projects has, however, been maintained as fully as possible and the results obtained may be summarized as follows:—

Sea trout smolts were again tagged on the River Tweed as a supplement to the programme conducted by the Ministry of Agriculture and Fisheries on the River Coquet. Netting took place from 3. to 12. May, and 4999 smolts were tagged. Recaptures later in the year totalled 10, of which 3 were made off the Norfolk coast, 2 were recaptured by French trawlers and 1 each from the Dutch and German coasts. Recaptures from earlier tagging experiments in this series were again disappointing, only 1 recapture being recorded from the 1953 experiment and none from the 1952 experiment. A further recapture was recorded, however, from the 1951 experiment bringing the total recaptures for that experiment to 85, or 2·4% of the fish tagged. The proportionate returns from the two succeeding experiments (0·3% and 0·1%, respectively) is very meagre in comparison.

A further 11 recaptures have been made of salmon tagged as smolts on the Tweed in 1952. In all, 16 recaptures have now been recorded from this experi-

ment, or 0·7% of the total tagged. There seems to be no significant difference between the returns from the batch of smolts released at sea and those released in the estuary. 5 recaptures—all from the Tweed—have been recorded from the salmon smolt tagging experiment carried out on the Tweed in 1953.

Salmon smolt tagging operations during 1954 were carried out on the Aberdeenshire Dee, because it was easier to arrange for batches of smolts to be taken to sea from the Dee than from the Tweed. During a period of some ten days in mid-May, 5000 smolts were tagged; half of these were released at sea and half in the estuary of the Dee.

Tagging of salmon caught in the bagnets at Rockall, near Montrose, was resumed this year, in order to compare the proportionate return with that recorded in the 1950 and 1951 experiments, which were conducted before an extension of the weekly close time. Between the beginning of May and the middle of August, 497 fish were tagged and 175 recaptures have so far been recorded. These represent 35·2% of the fish tagged, a proportion very similar to the values recorded in the two previous experiments. It will be necessary to continue this experiment in 1955 and 1956 in order to assess the statistical significance of the results.

A further programme of salmon (grilse), kelt, and sea trout kelt tagging was carried out on the Aberdeenshire Dee during November. Although conditions were by no means ideal, 116 salmon kelts and 402 sea trout kelts were tagged. This stock of tagged fish will be supplemented later by kelts caught during their downstream migration. The kelt tagging experiment of 1953 provided an encouraging number of returns. Records were received of the recapture of 16 salmon kelts and 32 sea trout kelts during their downstream migration, and, subsequently, 4 salmon and 102 sea trout have been recaptured as clean fish. Most of the sea trout were recaptured in Dee, but 20 fish were taken at other sites ranging from the north of Aberdeenshire coast to a netting station south of Montrose.

An additional tagging programme was carried out by the staff of the North of Scotland Hydro-Electric Board, who kindly agreed to tag the fish they stripped on the River Garry, Invernessshire and at Loch-na-Croic. 38 females were tagged on the Garry and 542 at Loch-na-Croic.

Arrangements for the statutory diagnosis of furunculosis have been transferred from the Bacteriology Department, University of Edinburgh, to the Bacteriology Department, University of Aberdeen, and this has provided an opportunity for beginning research again on furunculosis and initiating investigations on other diseases of salmon, such as "Dee disease". Work has begun on the viability of *Bacillus salmonicida* and methods of culturing the causative agent of Dee disease are being studied.

The outstanding feature of the work carried out by the Brown Trout Research Laboratory, Pitlochry, during the year has been the extension of the field investigations to areas outside the Tummel-Garry catchment area. Work is now in progress in the Scourie and Durness areas of Sutherland and in Caithness. This development has taken place for two reasons. First, it was felt that the time had come when the knowledge of trout gained in the Pitlochry area should be compared with that from others areas and, second, that work could profitably be begun on the management of trout populations. The Scourie area of west Sutherland offers conditions which seem particularly suitable for investigations of trout populations, since it is one in which there are a large number of small lochs, each with a population of trout. Many of these are of no commercial or recreational value and so can be used for the somewhat drastic type of treatment this investigation seems to require. To begin with, a further series of field fertilization experiments is being conducted. Four lochs have been treated with phosphate or with nitrogen-phosphorus-potassium mixtures, with or without the addition of limestone. Attention is being concentrated on the characteristics of the fish, though ancillary studies are being made on the bottom fauna and on the chemistry of the waters of the lochs.

This new development has not been allowed to replace the other activities of the laboratory and progress has been made on a number of projects covering various aspects of work on freshwater communities. Further studies have been made on the "homing instinct" in brown trout and a further set of observations made on the spawning runs in the South Queich (Loch Leven, Kinross). Observations have also been continued on the fish of Loch Tummel, with particular reference to the inter-relationships of the trout, perch and pike and to the effects of flooding which took place when Clunie Dam was built a short distance downstream. Further work has been carried out on the characteristics of the gravel beds which trout use for spawning and laboratory investigations on the spawning behaviour of trout have been begun.

Routine bottom fauna surveys have been continued as necessary but studies have also been made on the biology of the larva of the caddis, *Leptocerus aterrimus*. Work has been continued, both in the field and in the laboratory, on the factors affecting the emergence of aquatic insects and investigations have been begun on the food of aquatic insect larvae, with particular reference to the utilisation of attached algae. Plankton studies have principally concerned the effect of the rate of water replacement on the plankton. In many Highland lochs, this rate is high and it has been shown that this can have both qualitative and quantitative effects on the plankton. The quantitative effects are such that the amount of plankton present in lochs with high rates of water replacement cannot be considered to be a reliable index of productivity. Attention is therefore being given to the bottom-living algae, which seem likely to prove more reliable guides to productivity.

The fertilization experiments in the Scourie area have meant that much of the effort of the chemistry section has had to be devoted to the selection of

suitable fertilizers and the investigation of the chemical changes which followed their addition, but other investigations have not been neglected. Most of these have been concerned with practical measures for fish management, such as the effects of rotenone treatment, but others have covered more fundamental topics, such as the phosphorus content of the bottom deposits and the phosphorus content of aquatic macrophytes and of members of the bottom fauna.

Spain

(J. Cuesta).

Salmon captures in the rivers of the Cantabrian coast (except the Narcea River) have been increasing, repeating once more the cycle with a maximum every five years, which maxima in the last decade coincided with the years 1944 and 1949. The number of fish taken in 1953 and 1954 in the different rivers were as follows:—

River	1953	1954
Sellan	1042	2919
Narcea	809	802
Navia	360	575
Deva-Cares	1285	1774
Nansa	93	146
Pas[1])	32	69
Ason	789	1321
Bidasoa	110	350

[1]) Salmon fishing is prohibited in the major portion of this river.

Artificial Propagation.

Operations were carried on during 1954/55 as follows:—

Hatchery	Number of eggs produced	
	Trout	Salmon
Guipuzcoa and Navarre	249,500	40,000
Asturias	225,000	415,000

Sweden

(B. Carlin).

Work was continued along lines of previous years and most of the investigations have been carried out by the Migratory Fish Committee, in cooperation with the Board of Fisheries and Fishery Research. Fourteen reports (in Swedish) have been laid before the Migratory Fish Committee.

The planting of salmon smolts tends to be the principal method of salmon conservation in Sweden. Accordingly the rearing facilities have been extended and the building of more hatcheries is in progress. One at Bergeforsen will, when completed, have a production capacity of 430,000 smolts a year, another at Forsmo of 113,000.

The work has mainly been concentrated on improving the technique of smolt rearing, including work on diets and on fish diseases. Investigations on smolt metamorphosis are being made in cooperation with the Zoophysiological Institute of the University of Uppsala.

The tagging programme has been carried out in a large scale. The main purpose has been to check and compare different methods of rearing and planting smolts. During 1954, 34,000 smolts were tagged.

Tagging of smolts in 1954

River Lule älv	820
„ Ume älv	454
„ Gide älv	545
„ Ångermanälven	11,446
„ Indalsälven	12,695
The coast off Indalsälven	300
River Ljusnan	725
„ Stensån	27
„ Ätran	805
	33,829

Since 1950, about 106,000 smolts have been tagged. 82,000 in the Baltic and the Baltic rivers, and 24,000 on the west coast. Up to the end of 1954 of these 1311 adult and 1794 young tagged salmon have been recaptured. Altogether 778 adult salmon tagged as smolts were recaptured in 1954 alone. These recaptures have considerably added to our knowledge of the migrations of the salmon both in the Baltic and on the west coast. Some of the tagging experiments have already given sufficient returns to indicate that the rearing of smolts could be a useful and economically sound way of maintaining the salmon stocks in rivers utilized for power production.

In 1954 1737 salmon smolts have been tagged with internal tags. Out of 17,000 smolts tagged with internal tags in 1952 and 1953, 89 were recaptured as grilse in the River Indalsälven in 1954.

During the year, 2024 salmon and 594 sea trout were tagged as adult fish. The collection and study of salmon scales, both from rivers and the sea, has been continued.

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Shellfish Committee.

1954

By B. Havinga

CRUSTACEA

Belgium

(E. Leloup).

Crangon vulgaris. The biological study of the shrimp was continued. Its aim is to ascertain the annual cycle of the stock of shrimps on the Belgian coast. The following data were obtained:—

(a) the total quantity of shrimps caught;
(b) the number of shrimps with or without eggs;
(c) the length distribution of a 1 kg.-sample of raw shrimps;
(d) the commercial and non-commercial quantities of shrimps caught;
(e) the length distribution of a 1 kg.-sample of commercial shrimps;
(f) analysis of the stomach contents of certain species of fish caught with the shrimp trawl.

During the study on the biology of the shrimps, observations were carried out on the fish caught with the shrimp trawl. All fish were measured, counted and weighed per species. This was in order to be able to identify the species of fish which frequent the Belgian coastal waters during the course of the year and also to establish the variations in their relative abundance.

Nephrops norvegicus. The biometrical measurements on *Nephrops norvegicus* were continued. The material came from South Iceland (Tvisker and Ingolfshöfdi), South Ireland (Fastnet) and the North Sea (south of the Dogger Bank) and was landed at the fish market of Ostend.

Denmark

(E. Ursin).

Pandalus borealis. Continuation of research in West Greenland waters. A paper dealing with the results of previous investigations has been prepared.

Biological investigations in the Belt Sea and the Limfjord.

England

(H. A. Cole).

Lobsters. Data on the length composition of the lobster catch along the West Wales coast is being obtained and methods of improving the fishery are being sought. Comparisons of the efficiency of various types of pots are being made.

Prawns. Work at Conway has shown that a special type of prawn pot from Poole is more efficient than any other of 7 types. Experiments on mesh-sizes and the most efficient numbers of "eyes" per pot are in progress.

Bait free in the pot resulted in catches twice as great as when it was held in a wire container. The catch using bait 24 hours old was half that obtained with fresh bait.

During a 24 hour period maximum catches were obtained at sunset. Greatest efficiency was by hauling every 3 or 6 hours. Smaller catches were obtained when the pots were fished at $1^1/_2$, 12 or 24 hrs. intervals.

Pink Shrimps (*Pandalus montagui*). The population in the Thames Estuary has been more abundant than in 1953. A survey in April showed that the shrimps were migrating into shallower water. The influence of temperature on the spring and autumn migration is not yet well established.

There was a big proportion (60—70%) of 1-year-old unmarketable shrimps and this should lead to improved stocks in 1955.

Experiments with meshes of different sizes are being conducted. It is hoped to reduce the catch of smaller unmarketable shrimps.

Studies of breeding behaviour are in progress.

Brown Shrimps (*Crangon vulgaris*). Surveys of the North Wales coast have been completed and a report prepared.

France

(Institut des Pêches).

Le laboratoire de La Rochelle a fait des prélèvements de crevettes grises, *Crangon vulgaris* FABR., sur les côtes de Charente-Maritime en vue de l'étude de la croissance et de l'époque de ponte.

Germany

(P. F. MEYER-WAARDEN).

Crangon vulgaris. Investigations made on the composition of the shrimp catches off Wyk on Föhr, Husum, Tönning, Büsum, Friedrichskoog, Cuxhaven, Sillenser, Deich, Varel, Wilhelmshaven, Neuharlingersiel and Norddeich were carried out from May until December. These collections have been made to study the damaging effect of the shrimp fishery on the young of food fish in connexion with the North Sea Convention for conservation of food fish. In addition, information is being collected on the quantities of unmarketable shrimps caught.

At all stations regular samples of 5—10 kg. have been taken from the fishing gear at sea and examined for the different species and sizes of the individual specimens. 511 samples (about 2500 kg.) have been taken.

In order to be able to examine the factors favouring the bacterial deterioration of shrimp meat, a number of chemo-physiological investigations have been made. The most important result of the investigations was that cooking aboard the cutters does not satisfactorily kill the activity of the ferments in the body of the shrimp nor the remaining activity of the ferments in the edible portion of the shrimps. During the cooking process only temperatures of 80—90° are reached, and for a short time only (8 minutes). A complete destruction of ferment activity did not take place until they were kept for 10 minutes at 80° or for 2 minutes at 90°, respectively. Thus it could be proved that for destroying the ferment decomposing protein, temperatures of above 90° are required or that the cooking process should be prolonged.

Experiments with a new boiler (boiler with double walls from Scheer) indicated that it is possible to attain with it a temperature of 100° within few minutes, and that the remaining activity of the ferments could thus be destroyed.

The foam which always develops during cooking aboard the shrimpers is due to the high protein content of the boiling water, but not to the boiling water itself. The foaming begins between 80 and 90°. Experiments with anti-foam agents, as they have already been used by the food industry for a long time (silikons) show that no foam develops by using these anti-foam agents. It is essential that by adding anti-foam agents to normal boilers, greater temperatures (96—98°) should be reached.

Tests with chromatic paper made with raw and cooked shrimps show that no qualitative changes in the composition of the amino acids occur by the cooking process.

The fact that the cooked shrimps contain smaller amounts of certain essential free amino acids than the raw ones, may be explained by the leaching effect of the cooking process.

Ireland

(F. A. GIBSON).

Initial experiments were started in September 1954 for exploiting the stocks of prawns (*Leander serratus*) in Irish waters. Two types of pots were tried out succesfully in September 1954, a typical French prawn pot and one of local design. During the winter months of 1954/55 these pots fished in east coast waters produced very few *Leander*, but caught very large quantities of pink shrimp (*Pandalus montagui*).

Netherlands

(B. HAVINGA).

Crangon vulgaris. Statistical investigations on the catches of shrimps per unit effort were continued. Indications were found that, since the investigations were started in 1946, a decrease in the catches per unit effort occurred in the southern districts, an increase in the Waddensea.

Norway

(A. DANNEVIG).

Homarus vulgaris. Statistics of the catches of lobsters on the coasts between Kragerø and Listal were collected over a long period. Details are published in *Annales Biologiques*, Vol. XI.

Scotland

(H. J. THOMAS).

Survey of Lobster and Crab Fishery. The survey of the creel fishery in Scotland has been continued and the data are in the course of preparation for publication.

The effect of varying mortality rates upon the sex ratio in the lobster has been studied and theoretical results compared with data on sex and size distribution observed in Scotland.

Lobster Tagging. The final returns of the series of tagging experiments carried out to establish the mortality rates of lobsters at a number of places on the Scottish coast have been analysed.

Parasites. An investigation has been commenced into the abundance and seasonal variation of the lobster parasite, *Nicothoë astaci*, occurring in lobsters taken from Orkney waters.

Gear. Tests have been carried out into the effect of size of creel eye on the number and sizes of lobsters and crabs caught.

Norway Lobster. Further data regarding the occurrence and biology of this species in Scotland have been compiled.

MOLLUSCA

Belgium

(E. Leloup).

Mytilicola intestinalis. As in previous years investigations were carried out during September on the mussels living at the coastal defences from Knocke to La Panne.

Denmark

(E. Ursin).

Chlamys opercularis. Investigations on the growth and distribution in Danish waters were brought to an end. The results are ready for publication.

England

(H. A. Cole).

Oyster Research.

At Burnham-on-Crouch work was continued on the factors influencing breeding and setting of oysters in the rivers Crouch and Roach. Production of oyster larvae was similar to that of 1953, but growth to settlement size was slow. Low water temperatures were considered to be the limiting factor.

Enrichment of the waters of the upper Crouch with superphosphate was repeated and a resultant slight increase in the flagellate population was obtained, but examination of the water showed it to have such a high natural phosphorus content that it is considered unlikely that this is the factor limiting flagellate production.

Further experiments on the use of DDT have confirmed the 1953 observations that oyster spatfall can be doubled on treated collectors, but owing to the sparsity of the spatfall, similar experiments with treated cultch yielded no significant results.

On the basis of cost in time and materials and despite such control measures the yield of spat from collectors over the past five years has been uneconomic.

The study of the breeding of *Crepidula* in the river Crouch has been continued. Larvae were present in the water from mid-May to the end of September. There has been a striking parallel between the survival and setting of oyster and *Crepidula* larvae in recent years.

Use of marked *Urosalpinx* has proved a quicker method of studying population densities of this pest. Results obtained confirm those found by grab survey. Curved roofing tiles have proved most effective as traps on some grounds.

Further studies on the feeding habits of *Asterias rubens* have shown that it exhibits a preference for *Crepidula* rather than *Ostrea*. Confirmation of laboratory experiments has been obtained by surveys in the river Crouch where the starfish is more abundant on limpet-infested grounds than on adjacent oyster beds.

The parasitic gastropod *Odostomia eulimoides* has now been found to be widespread in Essex and another pyramidellid *Chrysallida obtusa* has been found at Salcombe. Malformation of the shell and sometimes death of the oyster can result from the attacks of these gastropods.

The suspicion that *Polydora* attack may be an important cause of stunting of oysters has been strengthened by recent work but it has not been possible to confirm the suspicion because it has been impossible to keep the oysters free of infection in the field. Complete re-infestation of the shells of treated oysters took place within six weeks.

In the Conway breeding tanks larval production was poor and spatfall was negligible. As at Burnham, unfavourable temperature conditions seemed to be the cause.

Mussel Investigations.

Further evidence has been obtained that mussels raised from the sea bed or in fast moving water are less susceptible to infection by *Mytilicola intestinalis*.

Small scale experiments using the French "bouchôt" system confirmed that such methods keep down the *Mytilicola* infection. Growth of the mussels was rapid and they fattened well. Additional records of the parasite have been obtained from Fishguard and Teignmouth. It has also been recorded occurring naturally in *Paphia decussata* at Poole.

The parasite is more common in oysters from Essex and Cornwall than was originally supposed. 4% infection by 1—3 parasites is normal but there is no evidence of loss of conditions due to this.

At Conway results obtained by rearing mussels at different levels have shown that those mussels high on the beach grew more in winter than in summer, but increased their volume by only 3·4% in 18 months, compared with a 42% increase of similar mussels laid at low water of spring tides. Shell growth is reduced in lowered salinity but the meats are of better appearance and slightly fatter.

Escallops. The sledge dredge designed at Conway caught 3 times as many escallops as a standard dredge on a bed of large escallops.

Diving investigations on the Irish beds confirm that there is no migration of escallops.

Cockles. Heavy exploitation and low spatfalls on the Poole Harbour and Morecambe Bay beds have resulted in a marked decline in the population of these two grounds. In addition, encroachment by the rice-grass, *Spartina*, in the former place has decreased the area of the beds whilst at Morecambe Bay, the predations of oystercatchers are causing concern. These birds take large numbers of commercial-sized cockles and a case is being prepared in support of applications by the local sea fishing interests for action to reduce the numbers of birds.

In the Burry Inlet the rate of exploitation has increased, but following the increase in the minimum size limit, and the spatfall of 1954, there is reason to suppose that the stocks will be maintained.

Various Investigations.

***Sertularia cupressina* — "white weed".** Stocks in the Thames Estuary are still poor and it has not been possible to test improved types of gear. Field experiments on growth rate are being conducted and surveys of likely areas in Lancashire and North Wales have revealed small areas capable of exploitation.

Marine Nanoplankton Systematics. Material collected from various localities is being isolated and descriptions of some of the genera are now being made. In particular the genus *Platymonas* is being revised and it is hoped to follow this with other genera; *Chlamydomonas*, *Carteria* and *Dunaliella*.

Ecology of the species in relation to their availability as a source of food for marine larvae is also being studied.

Ciliary Motion Studies. Feeding rates of both adult and larval oysters and adult mussels in relation to temperature, salinity and turbidity are being studied.

Bacteriology. Improvements in the standard McConkey roll tube agar have yielded good results at Conway and comparative trials will be conducted at Burnham. Attempts are being made to develop a synthetic roll tube medium for growing *B. coli*.

France

(Institut des Pêches).

Ostréiculture.

La reproduction d'*Ostrea edulis* L. et de *Gryphea angulata* Lmk. en liaison avec les conditions hydrologiques a été suivie comme chaque année. Plus de 1,200 pêches de plancton ont été effectuées pendant la période de pose des collecteurs depuis le Morbihan jusqu'au bassin d'Arcachon.

Les huîtres plates fixées en claire en 1953 dans la région de La Tremblade ont été détroquées et mises en casiers; leurs croissance a été rapide et une nouvelle expérience de fixation a été entreprise en 1954.

Les essais de collecteurs ont été poursuivis comme les années précédentes.

La teneur de phosphore du sol de certains parcs a été déterminée; des engrais minéraux ont été répandus sur d'autres parcs et dans les claires.

Des recherches sur la nourriture, la croissance, la composition de la coquille, la déstruction des *Polydora*, astéries, poissons prédateurs ont été poursuivies.

Mytiliculture.

La croissance des moules sur bouchôts de la baie de l'Aiguillon en 1954 a été étudiée.

La répartition et le pourcentage du *Mytilicola intestinalis* St. par moule ont fait l'objet de recherches précises sur les côtes du Morbihan, en particulier.

Autres Mollusques.

Les bancs de *Pecten maximus* L. en rade de Brest, les gisements de *Chlamys varia* (L.) en Charente-Maritime, de *Chlamys opercularis* (L.) en Manche orientale ont été prospectés.

La station de La Tremblade a déterminé la croissance des lots de *Venus mercenaria* L. en provenance des U.S.A. mis en claires l'année précédente.

Germany

(P. F. Meyer-Waarden).

Mussel Culture. "Institut für Küsten- und Binnenfischerei" has again in 1954 intensively planted new mussel beds. As in previous years, great difficulties occurred in instructing the fishermen. The German fishermen do not agree that mussel culture can be carried out beside shrimp fishing.

In the following Waddensea areas mussel beds have been cultivated:—

(a) Schleswig-Holstein—west coast.
  1) Mainland and isle of Sylt.
  2) Mainland—Langness island and isle of Föhr.
  3) Mainland—isle of Nordstrand—isle of Pellworm.
  4) Waddensea area off Friedrichskoog east of the outer Elbe.

(b) Schleswig-Holstein—east coast (Flensburger Förde).

During recent years 4 large mussel beds have been cultivated and protected in the Flensburger Förde. At first, only half-grown mussels were relaid, but now it is also intended to set out greater numbers of seed-mussels on the mussel beds. The results are very good, so that in 1955 a further considerable increase in cultivating mussels can be expected. The mussel cultivation was possible by means of state assistance. In the present year the Fisherman's Association of Flensburg is carrying out the mussel cultivation from its own funds.

Investigations on the German *Mytilus edulis* and the Italian *Mytilus galloprovincialis*.

German and Italian specimens of *Mytilus* were investigated for their length and width. In addition, the weights of the valves and meat portions were measured. The volume was found by filling one valve with paraffin and weighing the paraffin model.

In addition, the quality index was determined. The investigations indicated no differences in the average meat weight, in the average quality index (proportion of space of the valves to weight of the meat), in the proportion of the length to the width of the valves, and in the proportion of the average meat weight to the average length.

Marked difference between the two species were:— 1) the proportion of the length to the height; 2) the Italian mussels had a valve space proportional to the growth of the meat, so that with increasing meat weight the proportion of the space in the valve to the meat weight remains the same, whereas in the German mussel the proportion of valve volume to meat weight decreases with the increase in the meat weight.

These differences are probably resultant from different conditions of living, and are not characteristics of the species.

Ireland

(F. A. Gibson).

Escallops. In 1954 investigations of escallop stocks were continued. In conjunction with an officer of the British Ministry of Agriculture and Fisheries, the beds at Bere Island Sound, Co. Cork, were examined and sampled by an aqualung diver, in July and November, when much valuable information was obtained both about the stocks and their exploitation. These observations corroborate the existing evidence that all age-classes are to be found on these beds, which are therefore self-supporting. This was confirmed by tagging results in which all recaptures (28% of 700 tagged) except one doubtful case were retaken in exactly the same bed where they had been planted, on average 200 days previously. The only 0-group escallop tagged was recaptured after 5 months in the same bed. All the evidence suggests that the beds are very local by nature. It was found that the traditional Irish dredge proceeds along the bottom in a series of long shallow leaps, and it is estimated from the ratio of time spent on the bottom to that spent off it, that it is about 10% efficient. A new dredge was designed in 1954, and so far its trials here suggest it to be considerably more effective than the traditional dredge. A study of the material collected from October 1952 to November 1953 is in the course of compilation.

Oysters. Observations upon selected restocked beds in Clew Bay, Co. Mayo, were continued.

Netherlands

(P. Korringa).

Oysters. Spatfall predictions based on lunar periodicity and plankton observations have been carried out throughout the summer season. The intensity of setting has been measured in the usual way. Due to the low water temperature the spatfall was very poor.

Investigations were carried out on the quality of marketable oysters; a method for determining the condition index was worked out and published. Despite the cold summer and the shortage of sunshine the quality was quite good.

Investigations on the phytoplankton production and the fertility of the water, which were started in 1953, were continued and much extended. For this purpose weekly samples of water were taken at low and high water.

Shell disease was absent in 1954.

Mussels. The quality of mussels in the Zealand waters and the Waddensea has been determined in the same way as in the oysters.

The intensity of *Mytilicola* infection has been studied, both in the Zealand waters and in the eastern Waddensea a regression could be observed.

Norway

(A. Dannevig).

Oyster. The conditions for the oyster were extremely good in the natural ponds near Arendal, the breeding, however, was poor.

In the artificial pond at Flødevigen we had a fairly good spawning, but no spatfall.

Portugal

(H. Vilela).

Ostréiculture. On a poursuivi les recherches pour l'introduction de l'ostréiculture dans le Tage, et aussi avec le même objectif, la récolte d'élements dans le Sado.

Dans ce but ont été pratiquées des récoltes de plancton et des déterminations de la salinité et de la température de l'eau de surface sur plusieurs endroits du Tage. On a essayé l'emplacement de collecteurs.

Au moyen de la méthode des coupes seriées et aussi par l'examen direct des fragments des gonades la variation saisonnière et la sexualité des huîtres (*Gryphea angulata*) en rapport avec leur milieu ont été étudiées.

Spain

(J. M. Navaz).

Conchyliculture. La région de Galice, située dans le NO. de la péninsule Ibérique, est la zone unique de notre littoral où existent encore quelques bancs d'huîtres residaux d'*Ostrea edulis*. Cette zone possède aussi la plus grande richesse de production des différentes espèces de mollusques comestibles distribuées sur les fonds abrités des rives de ses "rias".

Pendant l'année dernière 1954, le Laboratoire Océanographique de Vigo de l'Institut Espagnol d'Océanographie, a effectué de nombreuses inspections et reconnaissances des lieux qui avaient été demandés pour l'installation de nouveaux parcs et viviers de culture, principalement, pour les moules.

En même temps on a developpé les études concernant la production de la moule en culture expérimentale qui ont pour but les applications pratiques de la culture industrielle.

Dans la Section de Biologie du Laboratoire on élaborait un ante-projet pour l'exploitation des mollusques de la "ria" de Neya (Galice).

Pendant la campagne de l'été dernier, effectuée par le garde-côte "Xauen", bâtiment océanographique de l'Institut Espagnol d'Océanographie, on a commencé l'étude de l'état actuel des bancs de mollusques des "rias" de la Galice, laquelle a été poursuivie par les biologistes du Laboratoire Océanographique de Vigo, dans le but de faire la carte des gisements de mollusques.

Dans le Laboratoire de Vigo de l'Institut d'Investigations des Pêcheries on a poursuivi les travaux expérimentaux sur la culture de l'huître plate, spécialement en ce qui concerne la fixation, croissance,

mortalité et espèces concurrents, on a fait d'expériences d'immersion des collecteurs à tuiles chaulées le long de l'extension de ponte des huîtres avec un contrôle simultané de la température sur la fixation. Expérience de détroquage furent réalisées pour connaître, quelle était l'époque la plus favorable d'obtenir une croissance majeure et une mortalité plus petite.

L'étude des gisements naturels de mollusques a été poursuivie dès le point de vue des associations, croissance des espèces, nature du fond, etc.

Les observations sur la moule furent poursuivies. On a fait la comparaison de la croissance des moules entre les parcs situés aux différents endroits. La fixation des larves a été contrôlée.

Différentes observations périodiques du contenu de *B. coli* des huîtres et des moules furent réalisées afin de connaître leur état sanitaire.

De la part du Laboratoire de Santander de l'Institut Espagnol d'Océanographie on nous communique que la présence de *Mytilicola intestinalis* a été constatée pour la première fois à Santander, et que des observations se sont entamées pour déterminer l'extension de la zone affectée ainsi que sur la biologie du parasite.

Quelques essais avec l'emploi des engrais minéraux ont été effectuées dans les étangs à mollusques et poissons.

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Hydrographical Committee.

1954

By H. U. Sverdrup

Belgium

(E. Leloup).

1. Aboard the lightship "West-Hinder":—
   (a) a water sample every three days for the determination of the surface temperature, Cl, salinity and alkalinity;
   (b) once a week, a water sample for complete chemical analysis, Cl, salinity, alkalinity, silicates, sulphates, calcium and magnesium;
   (c) continuous current measurements with the "Carruthers Vertical Log Current Meter".

2. Aboard the school-ship "Commandant Fourcault":—

   Line Gravelines—Deal (Stations B13, 14, 15, and 16) and Belgian coast (Station B22, off Nieuport) once a month in January, February, April, May and July:—

   (a) a water sample at the surface (1 m.), at the bottom as well as at 20 and 40 m. according to the depths (temperature, Cl, salinity and alkalinity);
   (b) a water sample at 20 m. at each station for

complete chemical analysis (Cl, salinity, alkalinity, sulphates, calcium and magnesium).

3. Aboard the fishery research vessel "Hinders":—
   (a) the observations on the stations of the Line Gravelines—Deal were carried out aboard the fishery research vessel during September, October, and December.
   (b) when the "Hinders" put to sea on experimental fishing, water samples were taken regularly at the surface on different points of the Belgian coast.

The results of the analyses of the water samples are communicated, as regularly as possible, to Mr. Jens Smed, Hydrographer of I.C.E.S. at Copenhagen, who compiles monthly charts of the surface temperatures and salinity, wind and current of the North Sea and English Channel and also for publication in the *Bulletin Hydrographique.*

Denmark

(Helge Thomsen).

Cruises. From the "Biologen" observations of t and S were made in the Baltic-Belt Seas area in March, May, June, August, September, October, and November. Near Bornholm observations of t, S, and O_2 were carried out in September.

In the North Sea the "Dana" carried out hydrographical observations in May and September and "Jens Væver" in June, July, and August. Sections R and S were worked by the "Dana" in the first part of May and section R partly repeated in September.

The "Dana" worked the Faroe-Shetland section at the beginning of June, and carried out intensive hydrographical investigations in the area north of the Faroes during June. These investigations were supplemented by the Fishery Patrol Ship "Thetis" in January and July.

At the beginning of July the "Dana" worked the section along 62° Lat. N. from the Faroes to East Greenland, and a section from Cape Farewell to Hamilton Inlet and back to Frederikshåb. In July investigations were carried out in Davis Strait and on the West Greenland fishing banks. These investigations were supplemented by M/C "Adolf Jensen" and M/C "Immanuel".

By the end of August a section was worked from Cape Farewell to 51°00′ N., 11°10′ W.

Observations from Liners. Surface samples were collected from liners on the routes Lindesnes—Greenland, Lindesnes—Iceland and Esbjerg—Grimsby/London.

Observations from Lightvessels and Coastal Stations. Regular hydrographic observations have been made by the Danish Meteorological Institute as follows:—

1. Daily observations of temperature and salinity from 12 lightvessels and 17 coastal stations.
2. 4-hourly estimations of the surface current from 12 lightvessels.
3. Occasional observations of t, S and O_2 in the Bornholm Deep off Christiansø.

England

(J. R. Lumby).

Fisheries Laboratory, Lowestoft.

Salinity, temperature and dissolved oxygen observations were made in the Southern Bight in February in connexion with a study of plaice-egg distribution and organic production. The temperature of the water was generally low and the dissolved oxygen content was at about the 90% saturation level.

Salinity, temperature and current observations were made in March and April over an area off the north-east coast of England in connexion with plankton production studies. In early June salinity and temperature observations were again made in this area, this time in connexion with studies of plankton and the herring fishery.

In late June tests of the towed electrode method of current measurement were resumed in the Southern Bight. Salinity and temperature observations were made at the same time. The towed electrode apparatus was used in the Barents Sea in October and tested in deep water.

In October salinity and temperature observations were made in the Southern Bight in connexion with studies of the plaice distribution. A salinity and temperature survey was also made over the area of the East Anglian herring fishery in order to test the relation between the distribution of the fish shoals and that of the very turbid water spreading northeastwards from the Norfolk coast.

The "Ernest Holt" worked the West Bear Island section completely in March, October and December, and the South Bear Island section was worked in June. Stations S and W on the West Bear Island section were also worked in February, May, and August in order to get the maximum coverage of the volume transport across the section throughout the year. The observations show that the transport was high for nearly the whole of the year.

Observations on the relationship between water temperature and cod distribution were made in the area between Bear Island, Hope Island and Spitsbergen throughout the year. Bottom temperatures were found to be higher than in any year since the "Ernest Holt" started work in January 1949. An unusual tongue of water above 2° C. penetrating the Bear Island Channel towards Hope Island was a noteworthy feature. It gradually pushed northwards and had reached Hope Island by October.

The routine collection of surface salinity and temperature observations in the waters of the North Sea, English Channel and eastern North Atlantic was continued, and the use of recording thermometers in the various vessels making the observations is being extended.

A study of the depth of the wind-produced homogeneous layer in the oceans has been completed. The thickness of the layer in autumn in the eastern North Atlantic is found to be greater than would be expected from theoretical considerations. It is sug-

gested that this is due to increased turbulence at 200—400 metres depth resulting from increased currents.

National Institute of Oceanography.

Interchange of Energy between Sea and Air. Analysis of balloon ascents in the Trade Winds and Westerlies and measurements on a reservoir have given wind-stress coefficients of approximately 1×10^{-3} which seem to be about half those estimated from the slope of water surfaces and the development of storm surges. Possible reasons for the discrepancy are being investigated.

Calculations of the energy budget for 2-degree squares in the South Atlantic, Indian and South Pacific oceans, using the data collected at the Marine Division of the Meteorological Office, have been almost completed. They will be used as a basis for estimates of heat and water transport.

Response of the Sea Surface to Wind. A statistical summary of waves recorded by the O.W.S. "Weather Explorer" in positions I and J showed that during December and February, which were the stormiest months, maximum wave heights of 40 to 50 feet occurred in 10 per cent. of the records. June was the quietest month and there were no waves higher than 15 feet. The records show that the great storm waves met in deep water are something like 50 per cent. higher than those generated by the same storm conditions off the north coast of Cornwall. Apparatus was developed for the study of long waves with periods between 5 minutes and 1 hour. Further theoretical and practical studies were made of wave generation.

Water Circulation in the Oceans. Some measurements have been made of deep-water movements using slowly sinking acoustic transmitters, large drogues suspended on thin wires, and towed current meters (which use the same idea as the U.S. Bathypitometer). The movements were of the order of 5 cm./sec. at 1000 m. and 3 cm./sec. at 2000 m. The measurements were too few and too scattered to allow any useful deductions. The methods have been improved for another attempt.

Continuous recordings with the Carruthers vertical log have been made by ten British lightvessels and the results, together with those of two French and Belgian lightvessels, have been tabulated and supplied to the I.C.E.S. and other authorities every month.

Natural Oscillations in Lakes and Seas. Analysis of seiches on Lough Neagh revealed periods which corresponded to oscillations along the longer axis and diagonals of the lake, and side-to-side oscillations in the southern and northern parts. Some progress has been made with a theoretical study of the natural oscillations possible in the North Sea, and tide-gauge records from a number of ports have been examined for oscillations of non-tidal period. The phase-differences along the English coast indicate that the oscillations are due mainly to progressive waves travelling southwards.

New Instruments. Some progress has been made with methods for rapid analysis of sea water, and with the development of new techniques for studying energy transfer and measuring subsurface and deep currents and wire anglers.

Marine Biological Laboratory, Plymouth.

Monthly observations for temperature, salinity, total and inorganic phosphorus, and silicate were continued throughout the year at International Hydrographic Station E 1, 50°02′ N., 04°22′ W. The winter maximum for phosphate showed a tendency to rise above the values recorded during the past twenty years. On 21. December phosphate reached 0.53 μg. atom/l. and this was exceeded in January and February 1955. This increase has not been conspicuously reflected in the abundance of zooplankton or in a change in indicator species. In March 1954 in the entrance to the Bristol Channel around 51° N., 6°10′ W., phosphate was 20% higher and silicate 80% higher than at E 1 on the same day. The work for the year 1954 has been reported (Armstrong, Journ. Mar. Biol. Assoc. U.K., 1955; in press).

Department of Oceanography, Liverpool.

The routine observations of surface temperatures and salinities three times per week, at each of nine stations in the Irish Sea, were continued throughout the year.

Improved methods of determining nitrate, phosphate, and silicate in sea water have been developed, and research has been continued on the spectrophotometric determination of trace elements.

Observations of turbulence in the flow of a tidal current were made off Anglesey from the "William Herdman" in August, with the co-operation of the National Institute of Oceanography, using an electromagnetic flow meter.

Theoretical research on some problems in the dynamics of storm-surges was completed, and work was continued on the calculation of semi-diurnal tides in the Indian Ocean.

Finland

(G. Granqvist).

Hydrographic observations from 22 fixed stations (temperature and salinity), 6 lightships (temperature, salinity, wind, and current), 1 liner on the route Helsingfors—or Åbo—Copenhagen or Antwerp (surface temperature and salinity), 12 Archipelago stations (temperature and salinity), 13 tidal-gauge stations, 12 tidal-pole stations, and ice observations from about 70 ice stations, 5 ice breakers, and the Finnish winter liners.

From 7. July to 29. August a cruise in the northern Baltic was made with the new research ship M/S "Aranda". During this cruise 124 stations were investigated for salinity, temperature, oxygen, pH, alkalinity, and content of phosphate, silicate, Ca and

Mg. Furthermore, samples of the bottom fauna were taken at all stations, and the transparency and current were measured where possible.

France

(Institut des Pêches).

Le navire océanographique "Président Théodore Tissier" a appareillé de Brest le 8 Mars et procédé à l'hydrologie de la partie occidentale de la Manche.

Le mois d'Avril a été consacré à l'étude des conditions de températures et de salinités sur le Grand Banc de Terre-Neuve et dans le Golfe du Saint-Laurent (entre Saint-Pierre et la baie des îles au nord, les îles de la Madeleine et la presqu'île de Cap Breton à l'ouest, le Banquereau au sud). En outre, les tracés de sondages ont permis de compléter les sondes portées sur les cartes, de nombreux dragages ont ramené des échantillons de fond pour étude géologique; des lancers de bouteilles dérivantes ont été effectués pour l'étude des courants de surface.

Le navire a fait en Mai une coupe hydrologique de Terre-Neuve aux Açores puis à Vigo; et en Juin des stations de Vigo à La Rochelle, avec de nombreux crochets.

Du 23 Juin au 9 Juillet, la zone du plateau continental comprise entre les parallèles de La Rochelle et de l'île de Sein a fait l'objet de recherches hydrologiques et de dragages du fond.

Le 26 Juillet, le "Tissier" appareillant de Brest faisait route sur Boulogne s./Mer, puis sur les Fladen en Mer du Nord, de là sur les fonds de pêche à l'ouest des Shetland et de Saint-Kilda. Le banc Porcupine, à l'ouest de l'Irlande, a été sillonné en tous sens pendant une semaine, en vue de l'établissement d'une carte de pêche de ce haut-fond. Le navire a rallié Brest fin Août, campagne terminée, après avoir effectué 419 stations, 1200 prises de températures et prélèvements d'eau, 105 récoltes d'échantillons de fond, 1080 lancers de bouteilles dérivantes.

D'autre part le personnel des laboratoires côtiers de l'Institut Scientifique et Technique des Pêches Maritimes a déterminé aussi régulièrement que possible les conditions physico-chimiques aux stations fixes situées près de Boulogne, Roscoff, La Rochelle.

D'autre part les navires de la Marine Nationale ont effectué les observations suivantes:—

Le croiseur-école "Jeanne d'Arc" a prélevé un grand nombre d'échantillons superficiels d'eau de mer au cours de ses 2 traversées de l'Atlantique.

La frégate "Aventure" a travaillé sur les bancs de Terre-Neuve et en Mer du Labrador; elle a renouvelé la coupe Terre-Neuve Groënland, déjà effectuée l'an dernier avec un treuil atteignant 1600 mètres.

L'aviso garde-pêche "Ailette" a fait des observations en Mer d'Irlande, Mer de Norvège et Mer du Nord; ce navire a fait une coupe Brest—Iles Scilly—Dublin.

Un bâtiment de la Marine Nationale a effectué au départ de Brest des sections trimestrielles à l'entrée occidentale de la Manche ainsi que l'année précédente.

La mission hydrographique des côtes de France et d'Afrique du Nord a fait des stations dans le Golfe de Gascogne et à l'ouvert Atlantique du Détroit de Gibraltar.

Germany

(G. Böhnecke).

Biologische Anstalt Helgoland.

Hydrographic surface observations were carried out during four biological research cruises with the R/V "Uthörn" from April to September 1954 in the German Bight. From April to September the surface temperature at Helgoland was determined daily and the surface salinity weekly. Near List on the Isle of Sylt the surface temperature and salinity were measured at intervals of 10 days in the months March—October.

Deutsches Hydrographisches Institut, Hamburg.

Lightships.

1. Positions.

The present position of lightships from which routine observations are taken, are as follows:—

	Lat. N.	Long. E.
"Borkumriff" (since 17.3.1954)	53°44.4′	6°23.6′
"P 8"	54°16.0′	7°11.5′
"P 12"	54°00.0′	7°51.5′
"Elbe 1"	54°00.0′	8°10.7′
"Weser"	53°51.6′	7°53.2′
"Fehmarnbelt"	54°36.0′	11°09.0′
"Kiel"	54°29.9′	10°17.3′
"Flensburg"	54°50.3′	9°53.8′

2. Programme of observations.

Onboard "Borkumriff":—

(a) current measurements by cross-shaped log (Stromkreuz) every two hours;
(b) continuous current measurements by vertical log;
(c) daily measurements of surface temperature and salinity at 0800;
(d) every three or four days, at high and low water, surface temperature and salinity measurements on station;
(e) every saturday at 0800, one series (temperature and salinity) at a depth of 5, 10, 15, 20 m., and at the bottom with the Pettersson sampler.

On board "P 8", "P 12", "Elbe 1", and "Weser" as under (a), (c), (d), at "Borkumriff".

Onboard "Fehmarnbelt":—

(a) current measurements by cross-shaped log (Stromkreuz) every four hours;
(b) daily at 0800, one series (temperature and salinity) at 0, 5, 10, 15, 20, 25 m. depth, and at the bottom.

Onboard "Kiel" and "Flensburg":—

(a) current measurements by cross-shaped log (Stromkreuz) every four hours;
(b) daily at 0800, measurements of surface temperature and salinity.

3. Publication of observations.

The observations made during the three years 1951, 1952, and 1953, were published in the form of Year Books. ("Beobachtungen auf den deutschen Feuerschiffen der Nord- und Ostsee", in the "Meereskundliche Beobachtungen und Ergebnisse", 4—6. Deutsch. Hydrogr. Inst., 1954).

Liners.

Surface samples were collected 6 times per month from liners on the route Hamburg—Hull.

Institut für Meereskunde der Universität Kiel.

In 1954 the following cruises with serial observations were carried out by R/V "Südfall":—

(a) during the whole year in the Kiel Bay in connexion with biological research work;
(b) from 15.—18.6. one section through the Great and one through the Little Belt with 24 stations;
(c) from 26.6.—3.7. one section through the Baltic around Gotland with 20 stations; besides the usual reversing thermometer, an electrical thermorecorder was used to note the micro-structure of the thermal stratification.
(d) from 23.7.—9.8. in the area before the W. coast of Schleswig-Holstein with 117 stations.
(e) On the cruise through the Baltic astrophysical measurements were taken at Öland during the eclipse of the sun on 30. June.

In addition to these, routine observations on temperature, salinity, oxygen, inorganic P, partly on total P and nitrite in the Kiel Fjord were done.

Institut für Seefischerei, Hamburg.

In connexion with the investigations made in the interest of fisheries, the fishery protection vessels "Fritjof" and "Meerkatze" carried out hydrographic investigations on the fishing grounds of the German fleet. On the Iceland grounds there have been 15 stations, in the North Sea and the English Channel 63 stations.

Iceland

(U. Stefánsson.)

Cruises. Each month during the year fixed stations were worked in the north Icelandic coastal area. During these cruises measurements were made of temperature, salinity, dissolved oxygen, and inorganic phosphates. At the same time plankton samples were taken.

In connexion with the herring investigations in June extensive hydrographical surveys were made in the waters off the west, north, and east coasts of Iceland and in the area south of Jan Mayen. On a number of sections dissolved oxygen and inorganic phosphates were determined.

During July and the first part of August the herring investigations off the north and the north-east coasts of Iceland were repeated, and in conjunction with these BT-observations were made and a few hydrographic stations worked.

In August hydrographical and chemical investigations were carried out in the area off the north and the north-west coast of Iceland north to 69° N.

Surface Temperature Measurements were carried out as in previous years by means of thermographs installed in three ships, one running from Reykjavik to New York and two coastal liners.

Ireland

(A. E. J. Went).

It was not found possible to carry out hydrographical observations at sea during the year, and work was restricted to the collection of surface temperatures twice daily at the Conigsbeg lightship off the south-east coast of Ireland.

Netherlands

(J. W. Termijtelen).

Koninklijk Nederlands Meteorologisch Instituut, Afdeling Oceanografie.

1. Surface temperatures and salinities in the North Sea from liners on the routes Hoek van Holland—London and Ymuiden—Hull and from weatherships on their routes to or from stations Dogger Bank, A and M.

2. Three-hourly surface temperatures and hourly current measurements at 6 m. depth from the lightvessels "Terschellingerbank", "Texel", "Goeree", and "Noordhinder", Hydrographic observations at various depths during one week in Febr.—April on each of these lightvessels.

3. Subsurface hydrographic observations at Weather Station M during the latter half of 1954.

4. Hydrographic observations in and off the Eems estuary.

Rijksinstituut voor Visserijonderzoek.

1. Daily salinity measurements from the lightships "Goeree", "Texel", "Terschellingerbank" and "Noordhinder".

2. Hydrographic observations on fishery research cruises with "Antoni van Leeuwenhoek" in the southern and central North Sea.

Rijkswaterstaat.

1. Hydrographic observations in estuarine waters.
2. Wave measurements in coastal waters.

Zoölogisch Station (Den Helder).

Hydrographic investigations in the Waddensea area.

Norway

(J. Eggvin).

Directorate of Fisheries, Institute of Marine Research.

Cruises. During 1954 23 cruises were undertaken by "G. O. Sars", "Johan Hjort", "Krill" and 7 chartered vessels.

Hydrographic investigations were carried out in Norwegian coastal waters each month of the year, in the Barents Sea in March, July, September, October; in the Norwegian Sea in January, May, June, July, November, and December; in the Skagerak in May, June, and off West Greenland in June and July.

At 977 hydrographic stations 10,900 observations of temperature and 10,846 of salinity were taken. In addition, analyses of 3607 O_2 and 2740 P_2O_5 samples were made.

Current measurements, by means of serial current meters, were made during March and April in the Lofoten area and in June off the coast of Jan Mayen and at the Miss Boyd Bank (72°49′ N., 2°46′ E.) in the Norwegian Sea.

Fixed Oceanographic Stations. Routine observations of salinity and temperature from surface to bottom were continued during the year at the oceanographic stations Lista, Utsira I and II, Sognesjøen, Ona, Eggum and Skrova. At Lusterfjorden the observations ceased 30. September 1954.

Sea Surface Thermograph Service. Thermograph records were obtained from 7 liners running the following routes from Bergen:— (a) to Newcastle, (b) to Rotterdam, (c) to New York, (d) to Kirkenes (east Finmark), and (e) to Oslo.

Salinity samples were collected in fixed positions on these routes. Thermograph records were also obtained from a liner running between Southampton and the Canary Islands in January, February, September, and October.

Flødevigen Sea-Fish Hatchery, Arendal.

The "G. M. Dannevig" carried out hydrographic investigations in the Skagerak along the Arendal—Hirtshals section in January, May, October, and November; in the fjords of southern Norway in March, September, October, and November and in the coastal waters between Stavanger and Kragerø in January, May, and June.

University of Bergen, Geophysical Institute.

The M/S "Armauer Hansen" carried out hydrographical investigations along the Sognefjord section (from Bergen about 280 n. miles towards the northwest) and a section off Stad in August, along a number of parallel sections off Stad in July and August and in the fjords of western Norway in February, April, August, September, October, and December.

Weathership Stations M and A.

The regular oceanographic investigations on board the weatherships S/S "Polarfront I" and S/S "Polarfront II" were continued at station M (66°00′ N., 2°00′ E.) until 30. June and from 1. July until 31. December, corresponding investigations were carried out at station A (62°00′ N., 33°00′ W.). These investigations include 6 stations per week, of which one station to 150 m., four stations to 1000 m. and one station to about 2500 m. depth.

In addition, sea surface thermograph records have been taken at M and A and between these stations and Bergen.

Sea surface samples have been collected in fixed positions between the stations and Bergen.

Scotland

(J. B. Tait).

Scottish research vessels during 1954 operated in the northern North Sea in all months from March to October inclusive, in the Faroe-Shetland Channel and west Scottish coastal waters in February, March, April, June, July, October, and November, in Iceland—Greenland waters in May—June, and in the nearer north-eastern Atlantic Ocean in July and August.

Five vessels among them occupied 1474 hydrographic stations taking serial temperature and salinity observations to the numbers of 7359 and 6336 respectively. In addition, at selected positions and depths, were made 1890 oxygen observations, 3571 free and 102 total phosphate determinations respectively. Again with the co-operative assistance of weatherships to and from Weather Stations J and I, a total of 2535 surface drift-bottles was liberated from which the recovery to date has been approximately 15%, returns from North Sea liberations, alone, however, showing the much higher ratio of over 22%. Almost a 9% return also has been recorded from 600 plastic drift-envelopes released during 1954.

Portugal

(A. M. Ramalho).

No hydrographical observations were made in connexion with the Hydrographical Committee during 1954.

Spain

Instituto Hidrografico de la Marina (F. Balén).

Tidal observations for reduction of soundings were carried out in the following areas:—

Mediterranean Sea:	Arenys de Mar, Villanueva, and Geltru.
Atlantic Ocean:	El Ferrol del Caudillo.
W. coast of Africa:	Médano de Santiago, Puerto Rico, and Bay of Cintral.
Canary Islands:	Puerto Abona.

Current measurements were carried out on the following points:—

23°32.6′ N., 16°03.1′ W. 26°58′ N. 13°32′ W. 27°06.5′ N., 13°29.5′ W. 27°15′ N., 13°26′ W. 26°42.5′ N., 13°31′ W. 26°49.5′ N., 13°36.5′ W.	West coast of Africa.

Instituto Español de Oceanografia (R. Garcia-Rodriguez).

Cruises.

1. Mediterranean Sea. From Málaga to St. Anthony Cape, Ibiza, Mallorca, and Menorca in January—March with R/V "Xauen".

Salinity and temperature determination of sea water up to 0, 25, 50, 100, 150, 200, 300, 400, 500, and 600 metres depth.

Determination of phosphates and oxygen contents. Marine sediments catch. Larvae and plankton fisheries.

Preliminary studies to draw up fishery maps of Mallorca and Menorca.

2. North-west of the Peninsula. From the mouth of River Mino to Ribadesella in July—September with R/V "Xauen".

Salinity and temperature determinations in the same depths as during the cruise in January—March.

Determination of phosphates and oxygen contents. Marine sediments catch and larvae and plankton fisheries. Preliminary studies to draw up fishery maps of this area.

3. Tunny fishery at Barbate (Cadiz) in June—July with ships of the tunny fleet.

Biological, physical, and chemical studies in tunny fishery waters. Biological studies on species collected.

Coastal Laboratories.

San Sebastian, Santander, Vigo, Málaga, Barcelona, Palma de Mallorca, Santa Cruz de Tenerife. Investigations were carried out the whole year, except at Santa Cruz de Tenerife where work began on 1. August.

Weekly determinations on physical and chemical features of sea water at two fixed stations, one in the neighbourhood of the laboratory, the other off the port. Plankton and larvae fishery.

Mareographs.

At Pasajes, Santander, Gijón, La Curona, Vigo, Cadiz, Tarifa, Algeciras, Málaga, Ceuta, Las Palmas, Santa Cruz de la Palma, and Arrecife during the whole year.

Studies on tides, monthly graphs of every mareograph, monthly mean level, and yearly mean level.

Sweden

(B. Kullenberg).

The two permanent sections P and M were covered in March, July, October, November, and December.

Regular observations of temperature, salinity, and currents were carried out at Bornö Station and at 10 lightships.

The hydrographic investigations of the fjords of the Swedish west coast were continued. The section was covered in February, March, June, August, and November.

The deep basins of the Baltic were investigated in May, July, and August.

Optical measurements of suspended matter and yellow substance were carried out in August in the Swedish coastal waters in the Gulf of Bothnia, especially in the Bay of Sundsvall. Similar measurements were carried out in the Sound in May.

Plankton Committee.

1954

By Trygve Braarud

Belgium

(E. Leloup).

The following observations have been made:—

1. Aboard the lightship "West-Hinder":—
   (a) A weekly plankton sample (taken at the surface—filtering of 100 litres water—net silk No. 25) for phytoplankton.
   (b) A weekly plankton sample (taken vertically—from the bottom to the surface—net silk No. 3) for zooplankton.
2. Aboard the school-ship "Commandant Fourcault":—
   Stations B 13, 14, 15 and 16 of the Line Gravelines—Deal and Station B 22 off the Belgian coast: once a month in January, February, April, May, and July a plankton sample (taken vertically—from the bottom to the surface—net silk No. 3) for zooplankton.
3. Aboard the fishery research vessel "Hinders":—
   (a) The observations on the stations of the Line Gravelines—Deal were carried out aboard the

fishery research vessel during the months of September, October, and December.

(b) Regularly, when the "Hinders" put to sea on experimental fishing, a plankton sample (taken vertically—net silk No. 3) was taken on different points of the Belgian coast.

Denmark

(Jul. Grøntved).

1. Measurements of the amounts of organic matter produced by the phytoplankton have been carried out fortnightly in Great Belt ("Halsskov Rev" L.V.) and in Kattegat ("Anholt Nord" L.V.). In addition production experiments were performed throughout the year in the coastal localities Dybsø Fjord in southern Sealand and in Venø Bay in the Limfjord. Outside Danish waters production experiments were carried out onboard the R/V "Dana" on her cruise in the North Atlantic and in West Greenland waters. Also similar experiments were carried through for a year in a coastal area, Narssaq, in SW. Greenland.

In the production investigations the amounts of organic matter have been measured by means of radio-active carbon (C^{14}). Coincident with these experiments samples of phytoplankton were collected in most of the localities mentioned. The working up of this material has been partly finished.

2. Investigations on the food of the herring have been continued by collection of stomachs in the waters round Bornholm, and in the Bløden Ground area in the southern North Sea.

3. During the cruises of "Dana", "Jens Væver", and "F. V. Mortensen" in the southern North Sea samples were collected of zoo- and phytoplankton.

4. All along the route of "Dana" in northern waters zooplankton was collected with stramin-nets, in addition the plankton indicator and the Hensen-net were used for collection in some places.

5. In the Fylla Bank area, SW. Greenland, collection of phytoplankton has been carried out throughout a year.

6. The working up of zooplankton material collected with stramin-net on "Dana"s cruises in the North Atlantic 1947—53 has been completed.

7. Dr. G. Baxter Deevey, Bingham Oceanographic Laboratory, Yale University, has been working on zooplankton material from the Pacific Ocean as a visitor at the Plankton Laboratory.

England.

Lowestoft (J. G. Cattley).

Barents Sea. As far as possible an effort was made to cover again the stations worked in 1953 for purposes of comparison. Hauls were made at stations on the West Bear Island Hydrographic Section and south of Bear Island on each of the six cruises between February and October; between May and October lines up to 75°35′ N. were worked, and in August a few hauls were made west of Spitsbergen in 77°30′ N.

Considering the area as a whole, zooplankton was considerably more abundant in the summer of 1954 than in 1953. Between May and October the average standing crop of zooplankton was about 15 g. dry weight under 1 square metre, or about 75 mg. per cubic metre, compared with 9 g. under a square metre and about 45 mg. per cubic metre in 1953. The crop from March to May was about the same in both years as it was throughout the two years in the West Spitsbergen Current. The main increase in 1954 was in the deep water over the banks south and east of Bear Island.

Atlantic. Vertical hauls with coarse silk nets from 100 metres to the surface have continued from Ocean Weather Ships at Stations "I" and "J" in the eastern North Atlantic.

North Sea. The survey of the plaice spawning grounds in the Southern Bight were continued with two cruises, one in February and one in March. The area of eggs was found, as usual, to be associated with high salinity water of approximately $35\,^0/_{00}$.

Eleven successive cruises between March and June were made in a successful attempt to follow the processes of production in the sea from the physical and chemical basis through the plankton and up to the grazing herring, using an area off the NE. coast of England. The investigations commenced in March with a grid of observations in the locality of Devil's Hole and ended off Whitby in June. The drift of the area was followed largely as a result of identifying a patch of *Calanus*, but substantial confirmation was obtained from the use of a radio dhan. Observations were made on light penetration, nutrients, C^{14} uptake, microplankton, fine and coarse net plankton and fish traces.

In February and October production experiments based on the uptake of C^{14} and the measurement of light penetration were made in the neighbourhood of "Smith's Knoll" lightship.

Hensen-net observations at the usual monthly Flamborough Line stations were carried out from April to September as well as a cruise regularly made off the NE. coast in June in order to relate the fat content of the plankton to the subsequent condition of the herring.

On the Flamborough Line the general level of zooplankton has shown a striking decrease after having maintained a fairly steady level for many years. The figures for the number of *Calanus* did not correspond with the trend, however, abundance being rather greater than in the period 1946–1949, but a little below the good post-war years of 1950, 1951 and 1953. The phytoplankton catch, on the other hand, continued to maintain its post-war level. Corresponding dry weight and fat samples were lower than for comparable months of any year since 1949 for dry weight and 1948 for fat.

The dry weight and weight of fat from the stations of the June cruise differ from those of the Flamborough Line in that the dry weights are the second highest

since observations began, while the fat weight equals the previous highest obtained in 1952.

In October an echo-sounding and plankton survey was made over the East Anglian herring ground. The patch of *Rhizosolenia styliformis* never reached a density greater than 100,000 cells per cubic metre.

Plymouth (F. S. Russell).

Dr. H. W. Harvey has continued investigations on the growth in culture of several marine diatoms. *Skeletonema costatum*, *Nitzschia seriata*, and *Chaetoceras decipiens* required vitamin B_{12} (cobalamin) for the production of dense cultures.

Phaeodactylum (*Nitzschia closterium* f. *minutissima*) did not require addition of B_{12} to the culture medium, and it also needed little or no silicate. It was found that *Skeletonema costatum* contained 50 times more silica than phosphorus. When grown in enriched sea water with added soil extract, and containing some 2 mg. SiO_2 per litre, this diatom rapidly uses the silicate and then becomes silica deficient. It was observed that in many sea waters *Skeletonema* grew in bent or tangled chains and that this could be prevented by the addition of divalent sulphur, as sulphide or thiurea.

Dr. D. P. Wilson and Mr. F. A. J. Armstrong continued their researches on the biological differences between sea waters as shown by the development of the eggs and larvae of *Echinus esculentus*. It seems that major differences observed cannot be due to the multiplication of bacteria in the water samples between the dates of collection and testing.

No change in the poor macroplankton production level associated with the prevailing *Sagitta setosa* conditions has been observed by Mr. P. G. Corbin during 1954.

Collections made on a cruise along the French Biscayan continental shelf examined by Senora A. Alvarino of the "Instituto Español de Oceanografia", Madrid, have revealed some new records of the occurrence of *Sagitta frederici*, which had not previously been taken in the Atlantic farther north than French Morocco.

Dr. Mary Parke has continued her work on Chrysophyceae, and new species and forms already described are being studied by means of the electron microscope in collaboration with Prof. Irene Manton of Leeds University.

Miss D. Ballantine has examined two species of *Gymnodinium*, one of which (*G. veneficum* nom. prov.) has been shown to be highly toxic to fish and to some other marine animals, notably molluscs.

Espagne

((J. Cuesta).

Plusieurs centaines d'échantillons de plancton ont été récoltés au cours de la susdite campagne du "Xauen". Les laboratoires océanographiques de Santander et de Vigo, ainsi que le "Laboratorio de Investigaciónes Pesqueras", ont poursuivi la récolte et l'étude du plancton côtier.

La détermination du phytoplancton par la méthode Harvey a été faite chaque jour dans la ria de Vigo sur des échantillons d'eau pris d'un quai. Au cours des sorties du "Lampadena", les prélèvements d'eau à diverses profondeurs ont été faits à l'aide d'une pompe à vide.

France

(Institut des Pêches).

L'Institut des Pêches Maritimes en 1954 s'est attaché à souligner l'importance des recherches sur le plancton, soit comme indicateur (dans la pêche aux thons par example), soit comme source de nourriture pour les anchois et les huîtres.

Les Croisières de 1954. Le plancton recueilli en 1954 par quatre navires français dont le "Président Théodore Tissier" nous provient de plusieurs régions, entre autres:— la Manche (VII e, f, g, h), le Banc Porcupine (VII c), les Açores (IX b), la côte ouest du Groënland (XV), le banc de Terre-Neuve (XX).

Les Recherches. Les triages de plancton récolté au cours de quatre années consécutives par le navire "Président Théodore Tissier", dans les zones VIII et IX de la Convention Internationale ont permis d'entreprendre des recherches sur la distribution d'espèces indicatrices dans ces régions.

L'aire prospectée se situe exactement entre les 42e et 48e degrés de latitude nord et est comprise entre les côtes françaises et espagnoles d'une part, et le 14e degré de longitude ouest d'autre part.

Des cartes ont été établies, compte tenu des lieux de pêche du thon.

L'étude du plancton néritique et plus spécialement du phytoplancton a été entreprise en 1954 pour le Bassin ostréicole d'Arcachon (latitude nord 44°40′ — longitude ouest 3°30′) soumis au régime des marées atlantiques. Ont été observées également des recherches sur le phytoplancton provenant des croisières 1954 du "Président Théodore Tissier".

Station Maritime de l'Université d'Alger.

Comme l'année précédente, 8 chercheurs ont précisé divers faits sur le phytoplancton, le zooplancton et l'influence des courants marins sur la fertilité au large de l'Algérie, jusqu'à 25 milles des côtes.

F. Bernard, Professeur, a préparé un travail de 109 pages sur le courant atlantique en Algérie (dont l'épaisseur varie de 10 à 300 m. selon les vents), le courant oriental vers 300 m. de profondeur et leur peuplement en flagellés. Le dominant *Coccolithus fragilis* Lohm. est très favorisé par ce courant profond.

Madame J. Lecal a rédigé 3 mémoires sur le phytoplancton de l'Algérie et des Baléares, d'après les croisières du "Professeur Lacaze-Duthiers".

A. Hollande, Professeur, et M. Enjumet ont étudié divers radiolaires, notamment le singulier *Sticholonche zanclea*.

M. Hamon, J. Cachon, Mme F. Bernard, P. Rollin et R. Vayssière ont publié ou travaillé sur d'autres groupes du zooplancton (siphonophores, chétognathes, appendiculaires, copépodes . . .). Deux enregistreurs du modèle Hardy ont été achetés à Edinbourg et sont à l'essai en Algérie. De nombreuses prises au filet fermant ont été effectuées, et Mme F. Bernard prépare une note sur les méthodes quantitatives.

Germany

(J. Krey).

Biologische Anstalt Helgoland.

Observations on *Phaeocystis* in culture conditions has been begun and its development followed (Kornmann).

Since 1949 observations were made in the southern North Sea during summer months on the regular appearance of a larval form of Tubulariidae by cultivation of the species *Ectopleura dumortieri* (Anthomedusae) (Aurich and Werner).

Institut für Seefischerei, Hamburg.

Investigations were continued on the relation between the vertical distribution of larger phytoplankton and zooplankton species, the temperature discontinuity layer and the zone of high turbidity and preliminarily brought to a conclusion (Wulff).

Institut für Meeresforschung, Bremerhaven.

Some theoretical investigations on marine plankton and our knowledge about the species of pelagic organisms were carried out (Friedrich).

Institut für Meereskunde, Kiel.

Observations on meroplanktonic larvae of polychaetes and echinoderms in the Kiel Bight were concluded (Banse).

On one cruise of "Meerkatze" in May 1954 to the Iceland area samples of plankton, seston, albumin and chlorophyll were taken to get an idea about quantity and quality of biomass and seston (Hagmeier).

During April and May 1954 in the Waddensea of Den Helder and two fjords of the Kiel Bight observations were made on the relations of plankton, seston, phosphate, organic substance, chlorophyll and albumin (Postma, Krey).

On two cruises with "Südfall" in July and August 1954 to the area off the west coast of Schleswig-Holstein the fertility and the drift of the water from the Elbe were investigated (Krey).

Iceland

In connexion with the herring research work plankton samples from 687 stations were taken with the Hensen-net.

Ireland

(A. E. J. Went).

No work has been carried out.

Netherlands

(B. Havinga).

No report received.

Norway

(K. F. Wiborg).

Fisheries Directorate, Bergen (K. F. Wiborg).

1. Fish eggs and larvae were collected with Clarke-Bumpus plankton samplers in the coastal waters of Norway from the Halten Bank to North Cape in May and June. Cod larvae were on average more abundant than in 1953, except in the Vestfjord where the numbers were lower. Haddock larvae were quite common, in numbers up to 15 per m^2. of sea surface. Haddock larvae have not been recorded in any number in these areas since 1948. Saithe larvae were also moderately abundant, young larvae occurring farther north than in any previous year. Herring larvae were a little more numerous than in 1953, and very abundant on the Halten and Sklinna Banks, maximum 290 larvae per m^2. Capelin larvae were not found.

The plankton programme at the permanent hydrographical stations has been continued, but at Ona and Sognesjøen only during the first half of 1954. Plankton volumes were about normal at Eggum and Skrova, but below the mean at Ona and Sognesjøen. Salps were taken at Skrova in October. It is the first time that salps have been found in the inner part of the Vestfjord. In fjords further south, at Møre, chains of salps up to 1 metre long were observed from August to October.

A paper on the zooplankton investigations in Norwegian coast waters has been published.

At station M in the Norwegian Sea the plankton sampling by day and night hauls was continued till the end of June. The horizontal hauls at night yielded large quantities of euphausiids from January to April.

During the second half of 1954 plankton sampling has been carried out at station A in the Denmark Strait from the Norwegian weatherships. Vertical hauls from 100—0 m. and 25—0 m. were made once a week, and hauls in steps down to 2000 m. once a month.

On the "G. O. Sars" a few vertical hauls were taken with the Nansen net in the Barents Sea in March, and horizontal hauls with a high speed net for fish larvae on the Helgeland Banks at the beginning of April.

Vertical hauls were also taken on cruises in the Norwegian Sea from May to July and in the Barents Sea in September. All plankton samples have been examined cursorily and kept on index cards.

(K. R. Gundersen).

Investigations on the food conditions of the sprat have been carried out in some fjords south of Bergen from June to September. The plankton was very rich in July as compared with July of the previous year. The occurrence of fish fry, especially of sprat, has also been listed.

(G. Berge).

Steemann Nielsen's method of using radio-active carbon C^{14} for the determination of the production of phytoplankton has been modified and used during the cruises of "G. O. Sars" in the Norwegian Sea from May to July. Information has been obtained on the production in various parts of the area, and the further working up of the observations is in progress. Water samples for quantitative estimation of the standing crop of phytoplankton have also been collected in the same area.

(G. Dannevig).

As in previous years investigations have been carried out in the spawning areas of the sprat from the Oslofjord to Haugesund. Vertical hauls have been made with a 1-metre net in the period 25. May to 30. June.

University of Oslo, Institute of Marine Biology.

I. Surveys.

1. Quantitative phytoplankton surveys in the following areas were continued:—
   (a) The Norwegian Sea. Material collected during the "G. O. Sars" cruises in May—June, 1952—53, from the Spitsbergen area to the southern part of the Norwegian Sea. (E. Ramsfjell).
   (b) North of Iceland. (Th. Thordardottir).
   (c) The poll Hunnebunnen in south-eastern Norway. (T. Braarud and Bjørg Føyn).
   (d) The Dramsfjord. (T. Braarud, Bjørg Føyn and G. Rytter Hasle).

In addition, quantitative phytoplankton samples collected at Weathership A, south-west of Iceland, were examined. (W. Dawson).

2. The work on the zooplankton material collected during the Dramsfjord survey has been completed. (F. Beyer).

II. Special Investigations on Phytoplankton.

1. The 2nd and 3rd report on the "Michael Sars" material from 1910 has been completed. (K. Ringdal Gaarder).

2. The experimental studies on the autecology of *Ceratium* species were brought to a conclusion and a report is being prepared. (E. Nordli).

3. Studies on coccolithophorids by electron microscope were continued. A report on 26 species has been submitted for printing (P. Halldal and J. Markali). Reports of work on some other species were also prepared (J. Markali and E. Paasche, K. Ringdal Gaarder and J. Markali).

4. Physiological studies on marine diatoms and dinoflagellates were continued, in some cases on bacteria-free cultures. (Kjell Baalsrud).

Scotland.

Aberdeen (J. H. Fraser).

As in previous years, the Scottish research vessels "Scotia", "Explorer", "Clupea", and "Kathleen" collected plankton samples during their cruises in 1954. The nets used included the Hensen egg-net, International Standard Fine Silk, 1 metre tow net of 16, 26, and 60 meshes per inch, the Sheard High Speed Net, the Clarke-Bumpus and Hardy Indicator.

The main surveys were:—

1953	
October	East Scottish coast, Moray Firth and Fladen.
November	Fladen, northern North Sea, west Scottish coast.
December	East Scottish coast.
1954	
Jan./Febr.	North Scottish coast and Shetland.
March	Northern North Sea.
April	Faroe, northern North Sea.
May	Rockall, Iceland, Denmark Strait.
June	Iceland, Faroe, northern North Sea.
July	Faroe, Outer Banks, Rockall, North Sea 57°—59° N.
August	Rockall, Porcupine Bank, northern North Sea.
September	Shetland, Moray Firth.
October	Faroe, northern North Sea, Isle of Man to south-west Scottish coasts.
Nov./Dec.	North-western North Sea, west Scottish lochs.

The objectives of these investigations included the general assessment of the phytoplankton (Mr. T. Lovegrove), the zooplankton and the relationships between plankton and the environmental conditions (Dr. Fraser), and the 1954 broods of larval fish, particularly herring and haddock (Mr. A. Saville). Mr. Steele continued and extended his study of the productivity of the Fladen area.

Special collections have also been taken between the Firth of Forth and Shetland over the whole year by the "plankton indicator" for analysis at the Leith Laboratory as part of a collaborative programme on the herring-plankton relationships. Samples have also been analysed for fat and Vitamin A content (Dr. Fischer).

Reports of the results of these plankton investigations are given in the various sections of *Annales Biologiques*, Vol. XI.

Millport (S. M. Marshall).

Dr. Droop has continued his work on the culture of marine flagellates and is also studying the requirements of several of the common planktonic diatoms.

Dr. Orr and Miss Marshall continued their work on the feeding and digestion of *Calanus finmarchicus* using radio-active tracers. A few experiments with radio-active carbon confirmed the results obtained with phosphorus. Experiments were also made with the young stages including nauplii.

Mrs. Connell is making an investigation of the feeding behaviour of two species of euphausids, *Meganyctiphanes norvegica* and *Thysanoessa raschi*,

and of their seasonal variation in food in relation to depth, time of day, and size.

She is also making a comparative study of the feeding mechanisms and histology of various Mediterranean and northern species of Ctenophores.

Edinbourgh (K. M. Rae).

During 1954, some 37,000 miles of successful tows were made with the Hardy Plankton Recorder. The Scottish Marine Biological Association is once again indebted to the officers and crews of the weatherships and commercial vessels of many countries who were generous enough to co-operate and so make the work possible.

The routes traversing the North Sea were the same as in previous years except for the addition of a valuable new run between Copenhagen and Thorshavn. This became possible when the Faroe Steamship Company were good enough to allow their S/S "Tjaldur" to assist in the programme. However, owing to changes in the schedule of tours of duty on the international weathership stations some unusual routes were covered in the Atlantic; both the British and Norwegian weathership stood some watches on Station A, south of Iceland, and the Netherland weatherships steamed to Station M in the Norwegian Sea. It is not, therefore, practicable to list the records obtained as has been the custom in previous years.

Again, in working up the data stress has been laid on the distribution of *indicator species* and the effect of wind on their movements.

Between May and September, the more intensive survey of the plankton on the Scottish herring grounds was continued. In all, about 2,200 samples were collected with "plankton indicators" and "high speed samplers". By far the majority of these were taken for us by the Scottish Home Department's research vessels although, as before, commercial fishing fleet assisted. The usefulness of these data was enhanced during 1954 by the introduction of multi-depth sampling; during the research ship cruises five samplers were attached to a single warp at 2, 7, 15, 25 and 30 metres, respectively.

All the plankton collected during 1954 has now been analysed and details of the catches are available to anyone on application to the Oceanographic Laboratory, 78 Craighall Road, Edinburgh.

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